THE RELATIONSHIP BETWEEN ATTACHMENT QUALITY AND EXPRESSED EMOTION AMONG ADULT CHILDREN CARING FOR PARENTS WITH DEMENTIA

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ABSTRACT

CORY K. CHEN: The Relationship Between Attachment Quality and Expressed Emotion Among Adult Children Caring for Parents With Dementia
(Under the direction of Marilyn Hartman and David Miklowitz)

The purpose of this study was to examine the relationship between attachment quality and expressed emotion (EE) among adult children caring for parents with dementia. EE has been shown to significantly impact care-recipient outcome across a wide variety of chronic conditions including dementia. However, it remains unclear why some caregivers respond to their care-recipients with high EE and others do not. A significant body of literature has demonstrated that attachment significantly guides caregiving behavior across a variety of relationships. The current study attempts to explore whether attachment may serve as a model for understanding EE among individuals caring for a parent with dementia. Additionally, the current study examines attribution style as a potential mediator of that relationship. One hundred individuals self-identified as the primary family caregiver of a parent or in-law with dementia participated in the study. Caregivers were sent a questionnaire packet and participated in a one hour telephone interview. Structural equation modeling was used to test the substantive hypotheses and revealed some support for a relationship between attachment and EE; however, the pattern of findings suggest that different relationships exist among the various aspects of attachment and EE. Additionally, the proposed mediational model was not supported. Results are discussed with reference to the different methods of assessing EE and

attachment and how those differences may have impacted the observed relationships. Implications for future research and clinical intervention are also discussed.

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LIST OF ABBREVIATIONS

Original Term	Abbreviation
Expressed Emotion	EE
Parental Bonding Instrument	PBI
Adult Attachment Scale	AAS
Secure Base Script Assessment	SBSA
Level of Expressed Emotion Scale	LEE
Five Minute Speech Sample	FMSS
Attribution Style Questionnaire	ASQ
Locus of Control Behavior Scale	LCBS

OVERVIEW AND SPECIFIC AIMS

Providing care for individuals with Alzheimer's disease and dementia is among the most difficult challenges facing families caring for older partners and parents. Although there are aspects of the caregiving experience that are consistent across families, there is significant variability in the ways families experience, perceive, interact and cope with the task of caring for their family member. This study tests the hypothesis that "quality of attachment," the quality of the working models of relationships formed early in life, influences aspects of caregiving among caregivers of individuals with dementia, specifically the degree of criticism or emotional over-involvement that a caregiver expresses towards their care-recipient, i.e., the amount of expressed emotion (EE).

The EE framework has been widely used for understanding caregiving of individuals with chronic illness. EE has served as a useful framework for characterizing the caregiving environment and is predictive of outcomes in care-recipients across a variety of conditions including dementia. However, knowledge is limited regarding factors that influence the development of patterns of EE. One construct that may potentially play a role in the development of patterns of EE is attachment quality. Attachment theory has served as a framework for understanding the mechanisms underlying the development of caregiving behavior across a variety of relationships. It has been found to be associated with EE in a number of populations but that relationship

has yet to be demonstrated in caregivers of individuals with dementia (Diamond and Doane, 1994; Paley, Shapiro, Worrall-Davies, 2000). The findings of the current study begin to elucidate the relationship between attachment quality and EE among caregivers of individuals with dementia.

INTRODUCTION

Caregiving for Individuals with Alzheimer's disease and Dementia

Caregiving for individuals with a chronic illness places significant burden and strain on caregivers. The process of caregiving is associated with significant physical, emotional, and psychological stress and is particularly difficult for family members. Caregivers of individuals with dementia suffer from rates of psychiatric symptomatology as high as 48% (Brodarty & Hadzi-Pavlovic, 1990; Draper, Poulos, Cole, Poulos, & Ehrlich, 1992). In a meta-analysis of 84 articles, significant differences between caregivers and non-caregivers were found in depression, stress, self-efficacy, and general subjective well-being (Pinquart & Sorenson, 2003).

As family caregivers struggle to provide for the needs of their loved ones, patterns of interaction develop that are influenced by the nature of the illness, caregiver and care recipient characteristics, the relationship history between caregiver and care-recipient and environmental stressors. Hooley & Gotlib (2000) conceptualize the development of these interaction patterns as a system in which care recipient and provider mutually influence each other in ways that apply stress to intrinsic vulnerabilities in both individuals. This application of stress then impacts outcomes such as care-recipient relapse, and depression, stress, and burden, for both caregiver and care-recipient[1].

[1] Although under-represented in the literature, it is important also to note that the caregiver/care-recipient system is also impacted by reciprocal positive feelings and rewards associated with caregiving that are also likely to impact both caregiver and care-recipient outcomes.

EE as a Framework for Characterizing Interaction Patterns

Expressed emotion (EE) is one framework for characterizing the nature of interactions in families providing care for an individual with a chronic illness. It has been used to explore the relationship between caregiver/care-recipient dynamics and care-recipient relapse, depression, stress, and burden for caregiver and care-recipients. This model was originally proposed by George Brown whose work focused on families of individuals with schizophrenia (Brown, Monck, Carstairs, & Wing, 1962). Brown conceptualized EE as a reflection of the family's general attitude towards a patient and divided his construct into five dimensions: hostility, emotional over-involvement, criticism, warmth, and positivity. Emotional over-involvement (EOI) has been defined as the breakdown of the natural boundaries of the family situation. High EOI is reflected in a relative's intrusiveness or overprotective behavior, excessive self sacrifice, devotion, or exaggerated emotional response to the patient's illness or well-being. Family members with high levels of EOI may make statements such as, "I can't leave the house without worrying about him. What if I am at work and he needs me?" (Hooley & Gotlib, 2000; Leff & Vaughn, 1985; Patterson, Birchwood, & Cochrane, 2000). High criticism has been operationalized as a caregiver's critical attitudes and condemnation of a patient's behaviors. Remarks that reflect high levels of criticism express dislike or disapproval of something the patient does (e.g. "I get annoyed when he sits around smoking and doing nothing"). Hostility is defined as the generalization of criticism to the patient's personality and/or elements of rejection by caregivers. Hostile family members criticize patients for who they are rather than expressing distress at a behavior (e.g. "he's just lazy.") (Hooley & Gotlib, 2000; Patterson, Birchwood, & Cochrane, 2000). Although

warmth and positivity were part of Brown's original conceptualization of EE, they failed to consistently demonstrate the predictive power of EOI, criticism, and hostility.

Although EE is measured by coding attitudes verbally expressed by caregivers in the absence of their care-recipient and not by observation of interactions between family members, EE has been associated with differences in the way that family members interact. High EE caregivers (those high in criticism or EOI) have been found to be more negative and make more critical remarks directly to their care-recipients than low EE caregivers. They talk more and look and listen to their care-recipients less. High EE caregivers also demonstrate greater reciprocal negativity (escalating negative behavior in interpersonal interactions) and less reciprocal positivity, and are more emotional than low EE caregivers (Hooley & Campbell, 2002; Hooley & Gotlib, 2000; Kuipers, Sturgeon, Berkowitz, & Leff, 1983; Miklowitz et al., 1989; Miklowitz, Goldstein, Falloon, & Doane, 1984; Strachan, Leff, Goldstein, Doane, & Burtt, 1986; Valone, Norton, Goldstein, & Doane, 1983). More specifically, among relatives of patients with schizophrenia, when data assessing communication patterns are aggregated over a ten-minute face to face interaction, high EE families are characterized by criticism, intrusion, and high verbal output, whereas low EE families interact in a more neutral fashion (Strachan, Leff, Goldstein, Doane, & Burtt, 1986). These patterns tend to characterize high and low EE interactions across patient diagnosis and across type of relationship to care-recipient (spouse vs. parent) (Hahlweg et al., 1989; Simoneau, Miklowitz, & Saleem, 1998). Taken together, these findings suggest that although EE is operationalized as attitudes expressed in private, it indexes meaningful day to day interactions (Hooley & Gotlib, 2000).

EE as a Predictor of Negative Outcomes in Schizophrenia

Over the past 40 years, a substantial body of research has developed around the concept of EE in studies of schizophrenia. Butzlaff & Hooley (1998) performed a meta-analysis of 26 studies and reported that living in a high EE home more than doubled the baseline relapse rate for individuals with schizophrenia 9-12 months following hospitalization. Others report that across studies, when compared to low EE environments, high EE family environments have been associated with as much as 3-4 times the relapse rate in the 9-12 months following discharge (Miklowitz et al., 1989). The substantial body of literature supporting the relationship between EE and relapse in schizophrenia has made it clear that EE is a potent predictor of patient outcome for this population. EE has come to be recognized as among the most consistent predictors of relapse in schizophrenia (Patterson, Birchwood, & Cochrane, 2000).

EE and Other Populations

Many authors have attempted to determine whether the effects of EE for schizophrenia generalize to other populations. If EE was found to significantly impact outcomes of caregivers and patients across a wide variety of populations, it may be a construct that defines a fundamental aspect of caregiving rather than a phenomenon specific to schizophrenia. Over the past 30 years, EE has been repeatedly found to be a robust predictor of relapse or escalating symptomatology in wide variety of disorders. These disorders include affective disorders, eating disorders, physical conditions, substance abuse disorders, anxiety disorders, childhood disorders and personality disorders. The finding that family member EE is predictive of negative patient outcome in at least fourteen different conditions suggests that EE describes an extremely important

aspect of the caregiving environment that is relevant to a wide variety of chronic conditions (see Table 1.)

EE and Alzheimer's Disease and Dementia

Due to the degenerative nature of dementia, the typical methods for evaluating the impact of EE (recovery and relapse rates) do not apply, but when dementia specific outcomes are examined significant associations have been found for both care-recipient and caregiver (Tarrier et al., 2002). Higher levels of EE have been related to greater caregiver distress (Bledin, Kuipers, MacCarthy, & Woods, 1990; Tarrier et al., 2002; Wagner, Lodsdon, Pearson, & Teri, 1997). EE has also been associated with aspects of care recipient symptomatology and a number of non-cognitive features in patients. These include negative behaviors such as physical aggression, anger, threatening, uncooperative, or paranoid behavior, and the tendency to wander (Tarrier et al., 2002; Vitaliano, Young, Russo, Romano, & Magna-Amato, 1993). These findings suggest that some symptoms of dementia may be influenced by factors such as the family environment and are not solely a result of biological disease processes. Although EE does not seem to impact the rate of cognitive decline or functional decline among individuals with dementia, non-cognitive factors, such as the negative behaviors described above, have been reported to be more distressing to caregivers than deficits in cognitive abilities or activities of daily living (ADL) (e.g. bathing, dressing, using the toilet, eating, etc.). Furthermore, non-cognitive factors have been associated with the decision to institutionalize care-recipients (Vitaliano et al., 1993).

EE's Influence on Interactions between Family Members Above and Beyond Patient Characteristics

The often cross sectional nature of studies of EE make it difficult to determine whether EE represents a caregiver response to frustrating and stressful symptoms or a more stable interaction pattern that is related to, but independent of, the symptoms of the care-recipient. However, a number of findings support the conceptualization of EE as a cause rather than a result of worse outcomes in patients. For example, among individuals with schizophrenia, individuals at higher risk of relapse because they are in high EE environments do not display behavior that is significantly different from those in low EE environments (Hooley, Rosen, & Richters, 1995). Similarly, when high and low EE groups are compared with respect to the severity of positive and negative schizophrenia symptoms or behavioral deficits, no significant group differences are found (King et al., 2003; Strachan et al., 1989; McCarthy et al., 2004). Additionally, one study has suggested that in high EE families of individuals with schizophrenia, parents expressed significantly more criticism toward their *non-psychotic* offspring in direct interactions than did low EE parents (Valone, Norton, Goldstein, & Doane, 1983). Finally, among caregivers of individuals with dementia, a longitudinal study demonstrated that EE predicted negative care-recipient behaviors above and beyond baseline negative behaviors (Vitaliano et al., 2002). These results suggest that although patients in high and low EE environments may behave similarly and display similar levels of symptomatology, caregivers respond to that symptomatology very differently.

The strongest evidence for a causal link between EE and patient outcomes comes from family intervention studies which suggest that intervention efforts designed to

reduce EE impact patient outcomes. Birchwood et al., (1992; 1999) reported that if the frequency of critical, over-involved, and hostile interactions can be reduced there is a reduction in the risk of relapse over time. Similarly, a number of other studies have indicated that family-based interventions for schizophrenia that educate relatives about a patient's illness and improve communication and problem-solving result in drastic reductions in relapse over 9-12 months (from 50% without intervention to 10% relapse with intervention) (McFarlane et al., 1995; Pitschel-Waltz, Leucht, Bauml, Kissling, & Engel, 2001; Terrier, et al., 1988).

The similarity of the baseline symptomatology of patients in low and high EE families and the positive impact of interventions designed to change EE suggest that significant variance in family member reactions is in part a result of non-patient characteristics. The question of what mechanisms underlie the expression of EE is complicated and largely unanswered. Although EE was originally conceptualized as a trait like construct in which high EE relatives were believed to be intolerant, intrusive, and inflexible and low EE relatives were seen as tolerant, non-intrusive, and sensitive to patient needs, such a conceptualization fails to add to an understanding of etiology and maintenance of EE. Hooley and Gotlib (2000) present a diathesis stress conceptualization for how EE develops. They posit that underlying vulnerability factors such as greater inflexibility, an internally based locus of control, greater self criticism, or a specific attribution style may predispose an individual to display high EE when stressed by caregiving. However, the diathesis stress conceptualization still does not address the source of the cognitive patterns believed to make caregivers vulnerable to displaying high EE. An additional vulnerability factor may be the nature and quality of the caregiver's

childhood relationships with parental figures. These relationships have been demonstrated to influence later caregiving behavior and bias individuals towards specific cognitive patterns. One framework for understanding how these early relationships influence later behavior is attachment theory.

Attachment Theory as a Framework for Explaining a Variety of Interaction Patterns

One of the most comprehensive and well researched models for explaining interaction/relationship patterns across a variety of relationships comes from developmental psychology and attachment theory. Attachment theory examines the relationship between early interaction patterns with parental figures and later relationship relevant outcomes. John Bowlby (1969/1982) described the underlying mechanism for these effects as based on an "attachment system." The attachment system is defined as a socioemotional behavioral system evolved to facilitate survival and reproduction. He believed that the system resulted in children seeking protection by maintaining proximity to attachment figures in response to threat or danger. Based on the quality of the interaction between attachment figure and child, the child develops working models which define expectations for the availability and responsiveness of caregivers (Ainsworth, 1989; Ainsworth, Blehar, Waters, & Hall, 1978; DeWolff & van IJzendoorn, 1997; Sroufe, 1988). Similar to the idea of working models is the idea of a cognitive script. Over the course of repeated experiences with caregivers, individuals are believed to develop a sequentially ordered "attachment script" that helps predict the sequence of events involved in caregiving and helps to guide the child's behavior. Later in life, knowledge of these scripts helps to guide future behavior as these scripts are "instantiated" (or called up) whenever a current experience resembles the script (i.e.,

when caregiving is seen as necessary) (Schank & Abelson, 1977). Theoretically, these attachment scripts or working models provide a template for interpersonal interaction that influences how an individual seeks, anticipates and interprets all future interpersonal interactions (Bowlby, 1973; Main, Kaplan, & Cassidy, 1985; West & Sheldon-Keller, 1994). Individuals in fact impose these scripts on subsequent interpersonal experiences and behave in ways that not only conform to these scripts but also evoke the expected behaviors of others (Marris, 1982).

In addition to serving as a prototype for behavior, cognition, and emotion around *seeking* support, the working models and knowledge of attachment scripts eventually come to serve as a foundation for *caregiving* behavior. These working models and attachment scripts formed in childhood go on to serve as a foundation for the adult caregiving behavioral system (George & Solomon, 1996; Solomon & George, 1996). The goal of the caregiving behavioral system is to provide protection so that when internal or external cues signal the presence of a frightening, dangerous, or stressful situation for the care-recipient, the system becomes activated and a repertoire of associated behaviors becomes accessible to the caregiver (George & Solomon, 1999). This shift from attachment scripts for care-recipient behaviors to caregiving in parenting, intimate relationships, or elder care, is believed to be accomplished through an integration of new experiences with providing care into knowledge of existing attachment scripts (George & Solomon, 1999; Main, 1995; Main, Kaplan, & Cassidy, 1985; Van IJzendoorn, 1995). Thus, individual sensitivity to a care recipient is influenced by the working models and attachment scripts created from interactions with one's own caregivers. This sensitivity then guides that individual's pattern of interacting *as a* caregiver.

Attachment as a Predictor of Interaction Patterns: Parenting and Intimate Partners

The extensive literature on attachment effects among parents of young children and intimate partners serves as a framework for understanding how attachment may operate across types of caregivers. The gold standard for measuring attachment in adults is the Adult Attachment Interview (AAI), an hour long semi-structured interview. The AAI assigns individuals an attachment classification (e.g. secure/autonomous, insecure/dismissing, insecure/ambivalent, etc.). Research using the Adult Attachment Interview (AAI) has found that mother's attachment classification significantly predicted mother's parenting behavior (van IJzendoorn, 1995). Mothers who were securely attached to their own mothers were more sensitive to their children's needs. In contrast mothers who were insecurely attached displayed either rejection of their child's need for comfort or were inconsistently sensitive to their children's needs. More recently, cognitive and attachment theorists have developed a word prompt outline method of measuring an individual's knowledge of attachment scripts. This method involves providing individuals with a set of word prompts and asks them to produce a storyline based on those word prompts. The stories produced are then scored based on how well the story is organized around an optimal attachment script (Waters & Waters, 2006). Using this method for assessing knowledge of attachment scripts, Coppola et al. (2006), found that greater knowledge of attachment scripts are associated with an observational measure of maternal emotional sensitivity towards their infant. Given that the attachment system is expected to impact a wide variety of relationships and caregiving patterns, the behavior displayed by individuals towards their children may be similar to that expressed towards their older parents for whom they are caring.

Research has also demonstrated a relationship between attachment and patterns of beliefs, communication and support provision among adult intimate partners which may also generalize to older adult caregiving processes. AAI-determined attachment classification has been found to be related to willingness and ability to be a good listener, recognition of distress or concern, and responsiveness to distress among engaged couples based on observational data of couples' interactions (Crowell et al., 2002). Self-reported attachment style has been found to predict communication style, with more securely attached individuals adopting a more open communication style (Mikulincer & Nachshon, 1991). Attachment style has also been found to predict an individual's reassurance seeking and style of providing support. Men with a self-reported secure attachment tended to provide more reassurance and support to their anxious partners compared to men with an avoidant attachment. Studies have indicated that self-reported attachment style or attachment history have been associated with (1) differences in the tendency to discourage or dismiss the expressions of negative emotion, (2) the degree of controlling, intrusive or inconsistent care provision and support, and (3) levels of hostility (Bartholomew, 1990; Carnelley et al., 1996; Dolan et al., 1993; Feeney, 1996; Feeney & Collins, 2001; Kunce & Shaver, 1994). The parallel between these behaviors and those exhibited by high EE individuals suggests that similar mechanisms may underlie the interaction patterns across these different types of relationships. Overall, significant empirical evidence suggests that attachment-related scripts for relationships impact later relationship patterns, particularly relationship patterns around giving and receiving support (Collins & Sroufe, 1999).

Attachment as a Predictor of Interaction Patterns: Family Caregivers of Older Adults

Attachment's influence on relationship patterns could theoretically extend to family caregivers of individuals with dementia. Although both Bowlby (1979) and Ainsworth (1989) focused on childhood, they viewed attachment as characterizing behavior from birth until death. Some authors have articulated the relevance of the attachment system for interactions with older parents (Carpenter, 2001; Cicirelli, 1983, 1993; Krause & Haverkamp, 1996; Mancini & Blieszner, 1989). Although research that systematically examines the relationship between adult children's attachment to older parents is sparse, the existing literature suggests that the attachment bond remains in effect across the life span and impacts parent-child relationships in significant ways (Carpenter, 2001; Cicirelli, 1983; 1993; Krause & Haverkamp, 1996; Mancini & Blieszner, 1989; Markiewicz, Reis, & Gold, 1997). Recognition that the history of the relationship between individuals in a caregiving dyad impacts the current relationship is consistent with a number of studies indicating that retrospective reports of early experiences with parents impact children's reports of closeness to their aging parents (Pearson, Cowan, Cowan & Cohn, 1993; Whitbeck, Simons, & Conger, 1991). Although retrospective reports of parenting present significant limitations given their unreliability, these findings are consistent with studies of attachment which indicate that attachment classification predicts later behavior in intimate relationships (Crowell et al., 2002). Given the predictive power of these models for relationships with new individuals, it is likely that these models would demonstrate even stronger effects for relationships with the original attachment figure, such as in situations where adult children are caring for their older adult parent.

Recent findings indicate that attachment is predictive of a number of aspects of the caregiver's experience. For example, self-reported attachment style has been found to be strongly associated with caregivers' appraisal of social support, burden, well-being, caregiving difficulty, psychiatric symptomatology, as well as significantly associated with institutionalization of the care-recipient (Crispi, Schiaffino, & Berman, 1997; Markiewicz, Reis, & Gold, 1997). These findings are consistent with studies that suggest that self-reported attachment style is predictive of the way that an individual seeks and perceives support (Collins & Read, 1990; Feeney & Noller, 1990; Goldberg, 1991; Mikulincer & Nachson, 1991). Lower perceived support may cause individuals to experience greater stress and subsequently be more likely to institutionalize the care-recipient.

A number of studies have also examined the relationship between attachment and aspects of care provision. Cicirelli (1993) reported that self-reported attachment style influences the amount of care provision as measured by the number of hours daughters spent "helping" their elderly mothers. A "stronger attachment" was associated with greater amounts of care and less caregiver burden. However, Cicirelli did not differentiate between help that involved emotional support versus help that was more instrumental in nature. Carpenter (2001), differentiated between these two types of support and found that self-reports of a "stronger attachment" among adult daughters caring for their older mothers was associated with higher levels of emotional support provision. Interestingly, Carpenter noted that there was no significant effect of self-reported attachment bond on instrumental support suggesting that the attachment system may impact aspects of the caregiver/care-recipient relationship differently, potentially having the greatest impact on

emotion-related aspects of caregiving. These findings suggest that the quantity and quality of emotional support provided by individuals caring for their aging parents is related to attachment. Although the provision of emotional support is conceptually different from the concept of EE, the provision of emotional support impacts the quality of the caregiving environment described by EE. For example, an environment high in emotional support is unlikely to be associated with high levels of criticism or hostility. The current study is the first to examine the relationship between attachment quality and EE among caregivers of individuals with dementia.

The Relationship between Attachment and Expressed Emotion

Although no previous research has explored the relationship between attachment and EE among caregivers of individuals with dementia, evidence from other populations provide clues that such a relationship might exist. In the parenting literature, attachment classification predicted maternal EE (Jacobsen, Hibbs, & Ziegenhain, 2000). Among parents of institutionalized young adults, observational measures of attachment were associated with negative affective style (criticism, intrusiveness and guilt induction) in face to face interactions between parents and their troubled children. In particular, a mother's self-reported attachment style and history was significantly predictive of the degree of negative affect directed towards her institutionalized child (Diamond and Doane, 1994). Self-reported attachment history was also found to predict EE in a study of caregivers of individuals with schizophrenia (Paley, Shapiro, Worrall-Davies, 2000). These authors indicated that caregivers' retrospective report of overprotection from their own parents was related to the degree of emotional over-involvement they expressed towards their care-recipient.

A variety of theories have been espoused to explain the relationship between EE and attachment in these populations. Some authors conclude that for some individuals, feelings of helplessness in the parental role due to unresolved attachment experiences cause the attachment system to be chronically hyper-activated resulting in high levels of criticism and emotional over-involvement (Jacobsen, Hibbs, & Ziegenhain, 2000). Others suggest that the caregiving behavioral system that is tied to attachment becomes activated with its manifest caregiving behaviors under the experience of a chronic stressor (Paley, Shapiro, & Worral-Davies, 2000). Given the chronic needs of individuals with schizophrenia, the attachment-based scripts for caregiving become activated, resulting in characteristic patterns of emotional expression and coping in caregivers/care-recipient interactions. It is likely that given the chronic stress experienced by caregivers of individuals with dementia, a similar activation of the scripts for caregiving would occur and result in similar attachment influenced patterns of caregiving. Among caregivers of individuals with dementia, although attachment has not been explicitly related to EE, variables related to attachment have been demonstrated to influence the EE of caregivers. For example, the degree of self-reported intimacy between caregiver and care-recipient has been significantly associated with EE in caregivers of individuals with Alzheimer's disease (Fearon, Donaldson, Burns, & Tarrier, 1998). These findings indicate that in situations when care is being provided, an individual's early experiences can significantly predict caregiver EE.

Attribution as a Potential Mechanism Underlying the Proposed Relationship

In addition to the growing literature supporting a relationship between attachment and EE, there is also evidence that the attributions caregivers make for care-recipient

behaviors may serve as an underlying mechanism for this association. A large body of research has developed in a number of populations around the relationship between EE and caregivers' perceptions and beliefs regarding the controllability of a patient's symptoms. Additionally, a separate body of literature has suggested that attachment may influence a caregiver's perceptions and beliefs about their care-recipients. It is likely that caregiver attachment influences perceptions and beliefs about care-recipient's behavior and symptoms and those perceptions and beliefs then bias the caregiver towards specific patterns of EE. The following sections outline the literature supporting the relationship between attribution and EE and between attachment and attribution style.

Attribution and EE

Over the past 20 years a significant literature has formed around the influence of caregivers' beliefs on EE. Theoretically, the beliefs held by caregivers about a care-recipient's symptoms impact the manner in which caregivers feel and behave towards that care-recipient (Strachan et al., 1989). Weiner (1985) proposes that the causal descriptions that individuals make regarding events play a central role in defining the emotional and behavioral responses to those events. Weiner believes that the initial appraisal of an event is a global reaction in which the event is assigned a positive or negative valence. However, it is through causal ascriptions that differentiation in emotional responses occurs. For example, anger will result from an event which has a negative global valence if we attribute that event to factors that another individual has control over. In contrast, a negatively valenced event which we ascribe to uncontrollable factors will result in pity. Weiner believed that guilt was a reaction to events that had a negative valence but were ascribed to personal responsibility, in other words, negative

events that are caused by the individual him or herself (i.e. guilt resulting from self-blame). Following these emotional responses, behavioral sequences are initiated that guide the manner in which we interact with others.

This model can be applied to interactions between caregivers and care-recipients. When a loved one experiences a chronic illness, family members view this as a negative event. The secondary attributions caregivers make for this event defines their feelings and behaviors towards care-recipients. For example, if an individual with Alzheimer's disease displays aggression towards a caregiver, and if this aggression is attributed to something uncontrollable (e.g. progressive neurodegeneration), caregivers will react with sympathy. However, if the aggression is attributed to something within the patient's control (e.g. impatience), the caregiver is likely to respond with anger. Finally, if the aggression is attributed to something within the caregiver's control (e.g. failure to adequately care for the patient), the caregiver will likely experience feelings of guilt. Each of these emotional responses will be associated with different behavioral reactions. The expected behavioral reactions parallel the behavioral patterns described by EE. For example, feelings of sympathy may result in a desire to be caring and demonstrate understanding and flexibility, whereas anger may be associated with expressions of criticism and hostility. Feelings of guilt may be associated with behaviors that attempt to remediate and control the patient's symptoms.

Hooley (1985, 1987) and Greenley (1986) propose that if caregivers believe that care-recipients can control the problem behaviors they engage in, caregivers are more likely to behave in ways that are reflected in high EE. Hooley emphasized two contributing factors (1) the caregiver belief that the care-recipient's behavior is

undesirable and (2) the caregiver perception that the care-recipient's behaviors are controllable. Hooley believed that if these two conditions were satisfied, a caregiver would express high EE. Since 2003, thirteen published studies have examined the relationship between EE and attributions. Many of these studies have focused on families of individuals with schizophrenia but consistent relationships have been reported among caregivers of individuals with mood disorders, Alzheimer's disease, and mothers of children with behavioral problems. All of these studies have supported a relationship between EE and attributions (Hooley & Licht, 1997; Wendel, Miklowitz, Richards, & George, 2000; Tarrier et al., 2002; Bolton et al., 2003). As mentioned above, specific types of attributions are associated with specific aspects of EE (beliefs in controllability with criticism/hostility and self-blame with over involvement). The following sections review the empirical literature which lead to the hypothesized relationships.

Attribution and Criticism and Hostility[2]: Findings and Empirical Evidence

A significant literature supports the idea that both criticism and hostility are associated with family members holding patients responsible for their difficulties. Across studies of a variety of disorders and cultures, caregivers high in criticism attribute more potential for control to care-recipients of their symptoms than those low in criticism. Additionally, highly critical and hostile relatives attribute care-recipients' problems to factors that are stable (likely to apply in the future rather than just the current situation), internal (some feature of the care-recipient rather than outside world), and personal (something idiosyncratic about the person rather than universal and would be associated with anyone involved in a similar situation) (Barrowclough, Tarrier, & Johnston, 1994;

[2] Although criticism and hostility are presented as different aspects of EE they will be discussed together because findings have indicated that attributions associated with each are similar in nature and appear to differ primarily in intensity.

Brewin, MacCarthy, Duda, & Vaughn, 1991; Hooley & Licht, 1997). Barrowclough, Tarrier, & Johnston (1994), reported that high EE relatives of individuals with schizophrenia made three times as many attributions of patient responsibility (internal, personal and controllable attributions) than low EE relatives. These findings have been replicated in a Mexican-American sample and a sample in China (both with caregivers of individuals diagnosed with schizophrenia) (Weisman, Lopez, Karno, & Jenkins, 1993; Yang, Phillips, Licht, & Hooley, 2004).

It is important to recognize that the literature does present some contradictory findings in regards to the relationship between EE and attributions. One study reported no significant relationship between criticism and attributions (Chambless, Bryan, Aiken, Steketee, & Hooley, 2001). This study differs from the other studies in a number of critical ways. Most of the studies that have demonstrated relationships between attribution and EE used the Leeds Attributional Coding System which examines data from the Camberwell Family Interview to determine attributional style. In contrast, Chambless et al. (2001) used a self-report questionnaire to assess caregivers' beliefs regarding the degree to which care-recipients could control their symptoms. The scale calculated a mean level of belief in the controllability of symptoms. The authors suggest that the lack of a relationship between criticism and attributions may have been due to a failure to identify which items were most distressing to the caregiver. It is also possible that self presentation bias may have caused some respondents to fail to endorse beliefs in high levels of controllability. An additional consideration is that Chambless et al. (2001) examined anxiety disorder patients, who may evoke a different set of attributions than disorders with more clearly genetic, neurophysiological or neuroanatomical correlates.

Despite these few negative findings, the vast majority of the literature points to a strong relationship between the criticism component of EE and caregiver attributions of symptoms as being stable, internal, personal and controllable.

Attribution and EOI: Findings and Empirical Evidence

Although there is considerable evidence of a relationship between the criticism component of EE and attribution style, the relationship between EOI and attribution style is not as clearly established. In general, individuals with high levels of EOI appear similar to those with low EOI in the attributions they make (Barrowclough & Hooley, 2003). The relative infrequency of individuals who display only EOI (i.e., without also displaying high criticism) has been identified as one potential reason for the lack of positive findings. However, even in those studies with a larger EOI pure sample (individuals high in EOI but low on criticism and hostility) individuals high and low on EOI don't vary in their tendency to make internal, personal or controllable attributions (Barrowclough, Tarrier, & Johnston, 1994; Brewin, MacCarthy, Duda, & Vaughn, 1991). There was one study that suggested that mother's self-blame was associated with EOI; however other studies have failed to replicate this finding (Bolton et al., 2003; Wendel, Miklowitz, Richards, & George, 2000).

Attributions and EE in Caregivers of Individuals with Dementia

Although most of the research examining the relationship between attributions and EE has been in other populations, one study has explored the relationship between EE and attributions in caregivers of individuals with dementia. Tarrier et al. (2002) presented data on 100 caregivers of individuals with dementia. Forty one of those caregivers were rated as high on EE (defined as being high on either criticism or

emotional over involvement). As in previous studies high EE was associated with greater caregiver distress and burden (Vitaliano, Young, Russo, Romano, & Magana-Amato, 1993; Wagner, Logsdon, Pearson, & Teri, 1997). Caregivers with high levels of criticism tended to make attributions for patient behavior that reflected a belief the behavior was controllable and personal to the care-recipient (something idiosyncratic to the individual rather than universal to all individuals with Alzheimer's disease). Interestingly, caregivers rated as high EOI tended to make attributions of patients behavior as external to the patient but internal to themselves. In other words, the caregivers indicated that they blamed themselves for their parents' situation. These findings are consistent with the study mentioned above in which high EOI was associated with self-blame (Bolton et al., 2003).

Additional support for a relationship between EE and caregiver attributions in this population comes from the fact that non-cognitive features of dementia were associated with higher levels of EE whereas cognitive impairment and global severity of dementia were not. These findings are consistent with those for caregivers of individuals with schizophrenia, in which symptoms clearly associated with and thus attributable to a disease process are less likely to invoke anger, criticism and hostility from caregivers (Weisman, Nuechterlein, Goldstein, & Snyder, 1988). In contrast, symptoms not easily recognized as part of the disease process (e.g. non-cognitive features of dementia) are more likely to be attributed to a care-recipient's volition and more likely to result in anger, criticism and hostility.

Given that the severity of different types of symptoms predicts attributions and attributions predict the level of EE displayed, one might expect that the severity of

specific types of symptoms should predict level of EE. However, as discussed above, studies with a number of populations have not found this to be true, (Hooley, Rosen, & Richters, 1995; King et al., 2003; Strachan et al., 1989; McCarthy et al., 2004). An additional factor must influence the relationship between these variables. Some authors have suggested that one factor that has not been sufficiently studied and likely impacts the development of EE patterns is the relationship history between caregiver and care-recipient (Barrowclough and Hooley, 2003). The relationship history may serve to influence which caregiving dyads are more vulnerable to symptomatology impacting EE and which relationships are unaffected by symptomatology.

Attachment: A Potential Source of Attributions

Attachment serves as a useful framework for understanding how the historical context of previous relationships impacts attributions. For example, a more insecure self-reported attachment style and history have been linked to more stable attributions for negative events and a more external locus of control (Hexel, 2002; Mallinckrodt, 1992). The developmental literature conceptualizes attachment as one of the ways that individuals come to understand and organize their world (Bowlby, 1973). Attachment theory posits that unconscious working models influence the way that individuals view the world around them and particularly the attributions that individuals make within relationships (Main et al., 1985). A growing body of research in a variety of populations supports the relationship between attachment and attribution style. In the parenting literature, individual differences in parental attributions and perceptions of children have been related to mother's attachment classification (Benoit, Zeanah, Parker, Nicholson, Coolbear**,** 1997; Slade & Cohen, 1996). Other findings have indicated that mothers who

report more negative childhood experiences with parents attribute more intentionality to their children's misbehavior (Dagget, O'Brian, Zanolli, & Peyton, 2000). Additionally, among children, secure attachment classification predicts a greater likelihood of attributing more positive intent to ambiguous peer behavior (Cassidy, Kirsh, Scolton, & Parke, 1996). Taken together, these findings provide increasing evidence among parents and children that a more insecure attachment style is associated with a tendency to misattribute intentionality to negative behaviors.

An association between attachment and attributional style has been found within intimate relationships as well. Insecure self-reported attachment style has been correlated with negative beliefs about others (e.g. mistrust and misinterpretation of others' behavior towards them) and a lack of belief in one's ability to control outcomes (Collins & Read, 1990; Dolan et al., 1993). Additionally, in a study that presented individuals with vignettes describing unresponsive partner behavior, self-reported attachment style was significantly associated with the degree to which an individual saw the partner's behavior as unresponsive, untrustworthy and purposefully rejecting (Collins, 1995). The attributions associated with attachment parallel those that are associated with EE. Although no studies have examined this relationship in caregivers of older adults, if these attachment based working models become activated, a similar pattern of attributions regarding controllability and self-blame may be observed.

Present Study and Hypotheses

The specific goal of the present study is to explore the factors related to the quality of the caregiving environment as measured by EE among family caregivers of individuals with dementia. The study examines the relationship between EE and quality

of attachment among individuals designated as the primary family caregiver for an individual with dementia. Furthermore, the study tests the hypothesis that the attributions that caregivers make for their relative's behavior serve as a mediator for the relationship between attachment quality and EE.

Hypothesis I will examine the relationship between attachment quality and expressed emotions (see figure 1). It is predicted that poorer attachment quality will be associated with higher levels of EE. More specifically, I predict that a latent variable "attachment quality" consisting of three manifest variables: the Parental Bonding Instrument (PBI) retrospective self-report of relationship quality with the participant's mother, the Adult Attachment Scale (AAS) self-report of current attachment behaviors, and the Secure Base Script Assessment (SBSA) rating of knowledge for a caregiving script will be significantly associated with a second latent variable "expressed emotion" based on the Five Minute Speech Sample and the subscales of the Level of Expressed Emotion Scale (LEE). As part of hypothesis 1, I will adapt, test, and validate the SBSA for use with caregivers of older adults with dementia.

Hypothesis II will examine potential mechanisms for the relationship between attachment quailty and EE. Structural equation modeling will be used to test the hypothesis that the relationship between the latent variable "attachment quality" (as described above) and the latent variable "expressed emotion" (as described above) is mediated by the latent variable "attribution style" (the pattern of explanations that an individual has for their experiences and the behavior of others) as measured by the Control of Symptoms Scale (CSS), the Attributional Style Questionnaire (ASQ), and the Locus of Control Behavior

Scale (LCB). The strength of each of these relationships will be tested simultaneously using structural equation modeling (see figure 2).

I hypothesize that attachment patterns developed in childhood and elaborated on throughout life as reflected in the latent variable "attachment quality" will influence the explanations that caregivers have for their care-recipient's behavior. For example, caregivers with a poorer quality of attachment would more likely believe that the care-recipients have control over their behaviors. As a result, they may be more likely to attribute intentionality to care-recipients for distressing behaviors. The tendency to blame care-recipients for their behavior is believed to result in greater criticism, hostility, emotional over-involvement, and perceived criticism as reflected in the latent variable – "expressed emotion."

METHODS

Participants

Participants in the current study were recruited using four methods: (1) previous participants from the Alzheimer's Association's Dementia Care Study (20% of the final sample), (2) an email sent to UNC staff, students, and faculty (71% of the sample), (3) referrals from previous participants (snowball sampling) (7% of the sample), and (4) flyers placed in nursing facilities, senior centers, memory disorders clinics, etc. (2% of the final sample).

Dementia Care Study

Participants in the study were initially recruited from individuals who had participated in the Alzheimer's Association Dementia Care Study conducted by the Cecil B. Sheps Center for Health Services Research at UNC – Chapel Hill in 2002-2003. This was a study of older adults with dementia residing in assisted living facilities and their caregivers. All of the individuals from this sample who participated in the current study were family members who had been identified by staff as the primary caregivers. Of the 33 facilities who participated in the Dementia Care study, 15 (45.5%) provided all requested information. Two (6%) of the facilities were closed. Others were unwilling to provide updated contact information for their residents, due to recent changes in health care privacy legislation. Nevertheless, 2 (6%) confirmed the phone numbers of family members but refused to provide a mailing addresses, 1 (3%) indicated that they would

pass the study information on to relevant family members, 4 (12%) indicated whether the resident was still living in their facility, and 8 (24%) indicated that all of the residents who had participated in the dementia care study had died. Of the 193 participants who enrolled in the Dementia Care Study, full contact information was obtained for 35 family caregivers. Of these 35 individuals, 4 had died, 7 were unable to be contacted, 4 refused, and a total of 20 individuals were enrolled in the current study. Of those individuals who enrolled, 18 completed all parts of the study, 1 individual completed the interview but did not return the questionnaire, and 1 individual returned the questionnaire but declined the interview.

UNC Email Recruitment

The majority of the individuals who participated in the study responded to an email that was sent to UNC students and employees. A total of 95 individuals contacted the principal investigator in response to the email that was sent requesting additional information. All those who responded to the email were sent a follow up email message describing the study further and requesting a mailing address and phone number for additional follow up and contact. Of those 95 individuals, 6 individuals were ineligible for the study, 2 individuals agreed to participate but were not able to be followed up with to schedule a time for the interview, 1 individual deferred participation because of a family emergency, and 17 individuals did not respond following the follow-up email. A total of 69 individuals ultimately completed all parts of the study and 2 individuals did not return their questionnaires.

Snowball Sampling

Additional subjects were recruited using a snowball sampling methodology in which participants were asked to provide referral information for individuals whom they believed might be interested in the study. After obtaining referral contact information, we sent a letter with information about the study and followed up with a phone call to answer any questions and enroll interested individuals in the study. A total of 14 individuals were referred to the study by participants. One individual was ineligible for the study because her parent was deceased by the time we contacted her and six individuals were unable to be contacted. Ultimately, 7 individuals were recruited based on this recruitment method.

Flyers

Flyers describing the study were placed at the UNC and Duke Memory Disorders Clinics and various assisted living facilities, nursing homes, special care units and senior centers in the area. Two individuals responded to the flyer and contacted the principal investigator for additional information. Both of those individuals completed all parts of the study.

Participants

Our sample consisted of adult children or son or daughter-in-laws who were self reported to be the primary caregiver of their parent or parent-in-law with some form of dementia or memory deficit. The majority of our sample was female (85%). Participants consisted primarily of daughters (77%), with the remainder consisting of sons (14%) and other in-laws (9%). The majority of the sample was Caucasian (91%), highly educated (72% with a college degree or graduate degree), and had a household income greater than $50,000 (74%).

The majority of the care-recipients of the sample were mothers (78%), followed by fathers (13%); the remainder was either a mother or father-in-law (9%). The majority of the care recipients were living in an institutional setting (i.e. assisted living, nursing facility or special care unit) (53%); 9% of the care-recipients were living with the caregiver and 22% were still living on their own in the community.

Measures[3]

Attachment Measures

Parental Bonding Instrument (PBI). The Parental Bonding Instrument is a 25-item self report scale that asks participants for their recollections of parental behaviors and attitudes towards them during the first 16 years of childhood (Manassis et al., 1999). The measure was completed for the participant's memories of their relationship with their mother. Each item is rated on a Likert scale from 0 to 4 and scores are summed for overall and subscale scores. The measure was developed using factor analyses from self-reported experiences with parents in childhood and has generally been found to support two factors: care and overprotection (Parker, Tupling, & Brown, 1979). The PBI ratings of parental attitudes and behavior obtained from adult children have been highly correlated with the ratings of other informants (Parker, 1986; McCrae & Costa, 1988). The PBI is able to discriminate between the least optimal and most optimal attachment styles as defined by the Adult Attachment Interview (Manassis et al., 1999). Additionally, the PBI has been demonstrated to have strong test-retest reliability over a 10-year time span (Wilhelm & Parker, 1990). Although the attachment information provided by the PBI has been found to agree with information provided by the Adult Attachment

[3] Measures relevant to the current study are described below. Additional measures were included in the questionnaire packet. See Appendix II for Measures Chart.

Interview for individuals showing optimal attachment histories, it is not as sensitive to individuals who show idealization and anger towards their parents (Manassis et al., 1999). However, the PBI is among the most commonly used measures of adult attachment and has been significantly correlated with relevant outcomes in previous studies (Paley, Shapiro, Worrall-Davies, 2000). The measure demonstrated strong internal consistency in our sample (α = .99).

Adult Attachment Scale (AAS). The Adult Attachment Scale (AAS) is a 16-item self report measure that has been used to assess the current self-reported attachment style of adult daughters to their elderly mothers (Cicirelli, 1995; Carpenter, 2001). The scale items assess characteristic attachment behaviors such as distress upon separation, joy upon reunion, and felt security. Each item is rated on a 7-point Likert scale and summed for an overall scale score. Participants were instructed to skip the measure if the parent inquired about was deceased. The scale has high internal consistency (α=0.95) and 1 year test-retest reliability of 0.73. The scale also has a low correlation with social desirability and a high correlation with love, trust, and attachment ranking (Cicirelli, 1995).

Secure Base Script Assessment (SBSA). The SBSA is a narrative assessment instrument designed to evaluate the richness and coherence of an individual's "attachment scripts**"** and his or her knowledge of attachment based caregiving processes. The SBSA rating is believed to reflect the quality of an individual's internal working models and attachment representations. Participants were provided with a series of word prompts the outline a storyline involving caregiving. Participants were asked to produce a narrative based on the word prompts. Based on the coherence, richness, and degree to which these narratives match a prototypic secure base script, responses are rated on a scale from 1-7. High

scores contain extensive secure base content and a rich and coherent narrative. Low scores contain peculiar content and odd interpretations of the implied story lines (Waters, Rodrigues, & Ridgeway, 1998).

The SBSA was adapted for use with caregivers of individuals with dementia. New word prompts were developed by the principal investigator and Dr. Melanie Elliott Wilson in consultation with Dr. Harriet Waters, the creator of the original SBSA. The new word prompts were pilot tested on 9 subjects of similar demographic characteristics (age, race, SES) as the participants for the proposed study. Results were reviewed by Dr. Waters to ensure that the word prompts provided the appropriate information. The principal investigator and trained research assistants administered the newly developed SBSA word prompts and two previously established mother/child word prompts to all participants. The SBSA generally took approximately 20 minutes to administer. Every ten participants, interviews were listened to by the principal investigator to evaluate compliance with standardized interview procedures.

The principal investigator, Dr. Elliott Wilson, and Dr. Waters established specific scoring guidelines for the new word prompts based on pilot testing. All word prompts were scored by the principal investigator, Dr. Elliott Wilson, and Dr. Waters. All participant responses were scored independently by two scorers (the principal investigator, Dr. Melanie Elliott Wilson, or Dr. Harriet Waters). The two independent scores were compared and any scores with <2 point discrepancy were averaged to produce the final score. Scores with a >2 point discrepancy were discussed and then independently re-scored. If the re-scored values were discrepant by <2 points, those scores were averaged for the final score. Percent agreement was used to assess inter-rater

reliability. On each of the stories, percent agreement ranged from between 90-100% for the three individuals scoring the stories prior to discussion for any >2 point discrepancy. Additionally, the convergent validity of the new word prompts were assessed by examining correlations between the new word prompts and the previously established mother/child word prompts. The correlation between the means of the mother/child stories and the adult child/older parent stories was 0.44 ($p<0.0001$) suggesting moderate convergent validity. Additionally, the correlation between the means of the adult child/older parent stories and the Mansfield Cohen Aggression Scale was -0.03 (ns). The correlation between the adult child/older parent stories and the various stress measures ranged between 0.05 and 0.17 (all non significant) which suggested good discriminant validity.

Expressed Emotion Measures

Five Minute Speech Sample (FMSS). The Five Minute Speech Sample was used to measure EE in caregivers (Gottschalk & Gleser, 1969; Magana et al., 1986). The five minute speech sample was developed as an alternative to the Camberwell Family Interview (CFI) for measuring EE. Relatives are asked to talk about their feelings towards their family member for approximately 5 minutes. The audiotaped monologue is scored on nine aspects and the individual is rated as high or low on criticism, EOI and overall EE. Scores for the subscales of interest are based on the number of critical or emotionally over-involved statements that are expressed. The FMSS showed high agreement with the CFI (Magana et al., 1986; Malla, Kazarian, Barnes, & Cole, 1991). A recent review of EE measures indicated that the primary disadvantage of using the FMSS involves inflated Type II error rates; however if significant associations are found

between the FMSS and other outcomes, there is a high probability that similar findings would be present when using the CFI (Hooley & Parker, 2006). All speech samples were independently scored by Ana Magana-Amato, MA, one of the developers of the FMSS for assessment of EE.

Level of Expressed Emotion Scale (LEE). The caregiver version of the LEE was used to measure EE in the caregivers. This version of the LEE is a self-report measure consisting of 60 true/false items. The items are used to create four subscales that assess the degree to which caregivers: (1) are intrusive (intrusiveness) (2) respond in highly emotional ways (with anger or acute distress) that exacerbate patient distress (high emotional response) (3) have a negative attitude towards the illness (e.g. doubts that the individual is genuinely ill) (negative attitude); (4) have a low tolerance for disturbed behaviors or high expectations of the patient (tolerance/expectations). Higher scores on the LEE subscales indicate higher levels of expressed emotion. The LEE has been shown to be reliable and internally consistent (Cole & Kazarian, 1988) and has tended to correlate with ratings on the CFI (Kazarian, Malla, Cole et al., 1990).

Attribution Scales

Attributional Style Questionnaire (ASQ). The Attributional Style Questionnaire is a self-report instrument that assesses explanatory style for positive and negative events using the following dimensions: internal vs. external, stable vs. unstable, and global vs. specific causes (Peterson et al., 1982). The ASQ presents 12 hypothetical scenarios that the participant is asked to rate along each of these three dimensions. Dimensions are rated using a 7-point Likert scale. The sum for each dimension of the scale is then calculated. The ASQ has been shown to be a valid predictor of depression such that individuals who

are characterized as having more internal, global and stable attributions tend to display higher levels of depressive symptomatology (Sweeny, Anderson, & Bailey, 1986).

Locus of Control Behavior Scale (LCBS). The LCBS is a 17 item self-report questionnaire used to assess the extent to which an individual believes his/her problems or difficulties are within his/her control (Craig, Franklin, & Andrews, 1984). Items are scored on a 6-point Likert scale and summed to produce an overall scale score. The LCBS has good internal consistency (α= 0.79) and shows a good test-retest reliability of .73 over a 6 month period (Hooley, 1998). Additionally, self reported LCB scores among relatives of patients with schizophrenia have been shown to predict the relative's EE classification (Hooely, 1998).

Control of Symptoms Scale (CSS). The CSS is based on a measure described by Chambless, Bryan, Aiken, Steketee, & Hooley (2001). In that study, relatives of anxiety disorder patients were asked to rate the patient on the degree to which the patient could control 14 different symptoms characteristic of anxiety disorders on 5-point Likert scales. Relatives were asked to rate only those symptoms that the patient exhibited. The responses are averaged to yield a single score for each relative. In previous studies, the scale was internally consistent (α=0.80), normally distributed, and significantly associated with caregiver and patient distress and patient psychopathology (Chambless et al., 2001). In the current study the CSS was modified for use with relatives of individuals with dementia by substituting characteristic symptoms of dementia identified by the Problem Checklist (Gilleard, 1984). The Problem Checklist is a list of 23 observed behaviors that are significantly more common in older adults with dementia than those without dementia. Examples of items on the checklist are: always asking questions,

temper outbursts, wandering, and physical aggression. To determine the overall CSS score, responses were averaged to yield a single score for each relative (Chambless et al., 2001). As suggested by Chambless et al., (2001) a weighted CSS score was also calculated by multiplying the caregiver's ratings of each item by a caregiver rating of how distressing each behavior was to the caregiver. The mean across these items was then determined for an overall weighted CSS score.

Covariate Measures

Gilleard Strain Scale (GSS). The Gilleard Strain Scale is a measure of caregiver strain (Gilleard, 1984). It is a 13-item self report measure that asks participants to rate the degree to which they experience feelings such as embarrassment, frustration, danger, concern about finances, anxiety, etc. Each item is rated on a 3-point Likert scale and the sum of all items is used to create an overall scale score. In previous studies, high scores on the GSS have been associated with higher levels of EE (Tarrier et al., 2002).

Perceived Stress Scale (PSS). The PSS is a 10-item self-report measure of an individual's perception of stress (Cohen, Kamarck, & Mermelstein, 1983). Items are scored on a 5-point Likert scale and assess the degree of stress experienced by respondents in the last month. It is one of the most widely used measures for assessing stress and queries how unpredictable, uncontrollable, and overloaded individuals feel in their lives. It has been associated with self-reported health and help seeking behaviors (Cohen, Kamarck, & Mermelstein, 1983).

Caregiving Distress Scale (CDS). The CDS is a 17-item self-report measure of caregiving distress. The items assess five dimensions of distress: relationship distress, emotional burden, care-receiver demands, social impact, and personal cost. Higher scores

on the scale indicate higher levels of caregiver distress. The internal consistency of the scale was determined to be good (α=.55–.82) (Cousins, Davies, Turnbull, & Playfer, 2002). Within our sample, the scale was significantly associated with caregiver perceived stress and caregiver strain.

Caregiver Involvement (CI). A scale created for the original family interview of the Dementia Care Study was used to assess caregiver involvement (Sloane, Zimmerman, & Ory, 2001). The scale consists of 8 items and asks participants to report the frequency of their involvement in a variety of typical tasks that caregivers of institutionalized older adults perform (e.g. visiting the resident, calling the resident, monitoring finances, etc.). The frequency of involvement consists of the participant's self reported estimate of the number of times per day, week, month or year that an activity is engaged in. The sum of each of the items is then used to estimate the overall degree of family caregiver involvement. No information about the psychometric properties of this scale are available, however, in our sample, the CI scale was significantly correlated with caregiver burden and current attachment behaviors towards the care-recipient.

Minimum Data Set Cognition Scale (MDS-COGS). The MDS-COGS is a ten-point scale based on eight cognitive items. It is designed to be a continuous measure of cognitive status capable of measuring impairment ranging from no impairment to very severe cognitive impairment. The MDS-COGS contains items designed to assess memory, orientation, and decision-making and has been found to be a valid measure of cognitive status. It is completed by the family caregiver (Hartmaier, Sloane, Guess, & Koch, 1994). It has demonstrated convergent validity with the MMSE (Spearman correlation coefficient = -0.88, $p<0.001$). It has also demonstrated good to excellent sensitivity and

specificity for correctly discriminating cognitively impaired from cognitively intact subjects as defined by the MMSE. Sensitivity and specificity were above 0.90 and kappa coefficients of agreement were above 0.80 (Hartmaier, Sloane, Guess, & Koch, 1994).

Demographic information included SES, race, religion, education, gender, age, marital status, and relationship to individual with dementia (e.g. spouse, adult child, etc.). This information was collected for all participants and care recipients.

Caregiver Health Status was assessed with a single item which asked participants to rate their health on a scale of 1-5 (poor to excellent). Similar self-report measures of health have been shown to be significantly associated with a wide variety of health outcomes including mortality, coronary heart disease, stroke, diabetes, cancer, ADL's, lower hemoglobin, and higher white cell counts (Jylha, Volpato, & Guralnick, 2006).

Procedures

Pilot testing was conducted for all procedures and new measures to determine the final protocol for interviews and questionnaires. Letters were sent to potential participants outlining the study as well as providing some preliminary findings from the Dementia Care Study. They were then contacted by phone one week after letters were sent to answer questions, request participation, obtain consent, and schedule a time for a telephone interview (See Appendix I for family letter, consent form, and initial contact protocol). Verbal consent from participants was obtained over the phone. Participants were informed that the questions would involve their experiences with their parents when they were children as well as their experience as caregivers. After an individual had agreed to participate, interview materials and questionnaires were mailed to the participant with a self addressed, stamped envelope for return to the principal

investigator. Participants were asked to complete questionnaires prior to the date of the interview.

Participants were called at the scheduled time and administered the interview portion of the study. Interviews took approximately one hour and consisted of four parts. The first part of the interview consisted of an informal conversation that allowed participants to ask questions about and provide feedback on the questionnaires materials. Research assistants then used three standardized prompts to ask participants to discuss (1) the most rewarding parts of caregiver (2) the most challenging parts of caregiving and (3) who supports them in their caregiving and their level of satisfaction with the support that they receive. Research assistants were encouraged to ask follow-up questions during this period and were trained in active listening skills to build rapport and make participants feel more comfortable. The second part of the interview involved the administration of the Five Minute Speech Sample. The third part of the interview consisted of the administration of the Secure Base Script Assessment (SBSA) based on standardize instructions created by the principal investigator and Dr. Melanie Elliott Wilson. The final part of the interview consisted of thanking participants for their participation, asking for referral information for additional participants, and the administration of a final informal question about what advice participants would provide other caregivers. Participants who expressed distress around their caregiving experience were also offered referral information for support services. All interviews were administered by the principal investigator or trained research assistants.

RESULTS

The following results examine the two primary hypothesized models from the study: (1) a direct effects model in which adult attachment quality predicts expressed emotion, and (2) an indirect effects model in which the relationship between adult attachment quality and expressed emotion is mediated by attribution style. The following outlines the general analytic approach, and presents specific findings related to each of the hypothesized models and findings from post hoc analyses designed to provide greater insight into key findings.

Univariate analyses

Univariate descriptive analyses were conducted on all variables of interest and are shown in Tables 2 – 6[4]. These findings suggest that all key measures in our sample had sufficient range and variability to test our hypotheses. The Level of Expressed Emotion Scale and the Weighted Controllability Scales were not distributed normally within our sample. Estimators which adjusted for the lack of normality and provided unbiased standard errors were used in all Structural Equation Models (SEM) containing those variables.

[4] All descriptive analyses were conducted based on individuals completing the majority of the measures provided. Individuals who did not complete at least 50% of the questionnaires were excluded from these analyses.

Data Management and Missing Data

All variables in the analyses were standardized to have a mean of 0 and standard deviation of 1. Multiple imputation was used to estimate the missing data based on the data that are available. In contrast to traditional imputation methods, which tend to produce biased results because of the assumption that relationships exist among the variables in the data, multiple imputation inserts random variability into its estimates of missing variables. Multiple datasets, each with slightly different imputed values, are created in the imputation process and then used in subsequent analyses. Ten data sets were created through the imputation process with all relevant variables for analyses. All analyses described below use the standardized data from the 10 imputed datasets unless otherwise specified.

Testing the Measurement Models

Zero order correlations were conducted to assist in the construction of meaningful latent variables. Potential indicators of attachment quality, attribution style, and expressed emotion latent variables were examined for their relations within construct to determine the feasibility of their loading onto a single latent variable. For example, if a particular attachment measure did not show a significant zero order correlation with the other attachment variables, it was dropped from further testing in the measurement model and was evaluated to determine whether it would remain a separate "observed" variable in subsequent analyses.

Potential Attachment Indicators

The findings presented in Table 7 suggest that the Secure Base Script Assessment Indicators were significantly associated with one another; however, they were generally

not significantly associated with the questionnaire based measures of attachment. Based on these findings a measurement model with a single latent variable "Script Based Attachment Quality" was tested with the three adult child/parent script scores as indicators. Both the Parental Bonding Instrument - Maternal Rating and the Adult Attachment Scale were retained as separate observed predictor variables in later models.

The measurement model for the script based attachment quality latent variable as defined by the three SBSA older parent/adult child scripts supported the construction of this latent variable (see figure 3). Because this model was just identified, no fit statistics were available for evaluation; however all of the paths were significant and there was significant variance in the script based attachment latent variable (see Table 8).

Based on the above analyses the attachment variables that will be included in subsequent analyses consisted of: (1) a latent variable "script based attachment" based on the three narrative scores as indictors (2) the Parental Bonding Instrument as an observed variable and (3) the Adult Attachment Scale as an observed variable.

Potential Expressed Emotion Indicators

Zero order correlations for the expressed emotion indicators are shown in table 9. The five minute speech sample (FMSS) was significantly correlated with only one subscale of the Level of Expressed Emotion Scale measure of EE. Thus, it was used in SEM analyses as a separate observed endogenous variable. The LEE scale demonstrated significant or marginally significant relationships among its subscales, with the exception of the relationship between the attitude towards the care recipient subscale and the intrusiveness subscale. However because each of these subscales were significantly

correlated with other LEE subscales, a measurement model was tested with all of the LEE subscales as indicators.

Examination of the individual indicators of the LEE scale revealed significant multivariate kurtosis among the indicators (multivariate kurtosis = 17.24; critical value=12.44). Because of this, the measurement model examining whether these indicators loaded onto a single EE latent variable was run using the Maximum Likelihood Mean and Variance adjusted (MLMV) estimator, which provides unbiased standard errors under conditions of non-normality. The measurement model with the four LEE indicators produced a model with strong overall model fit (CFI=0.948, TLI=0.950, RMSEA=0.054). However, none of the indicators significantly loaded onto the latent variable EE (figure 4, table 10). These results suggest that the four indicators of the LEE are not good indicators of an expressed emotion latent variable. In subsequent analyses, the LEE subscales were used as separate observed outcome variables.

Based on the above analyses the Expressed Emotion variables included in subsequent analyses consisted of the following observed variables: (1) the Five Minute Speech Sample Overall Score, (2) the intrusiveness subscale of the LEE, (3) the high emotional response subscale of the LEE, (4) the negative attitude subscale of the LEE, and (5) the tolerance and expectation subscale of the LEE.

Potential Attribution Style Indicators

Zero order correlations among the attribution style indicators were conducted (table 11). All subscales of the Attribution Style Questionnaire demonstrated either significant or marginally significant zero order correlations. However, the weighted mean controllability subscale and the Locus of Control Behavior Scale failed to show

consistent significant relationships with the other attribution measures. As a result, a measurement model with the ASQ subscales as indicators was tested and all other indicators were used separately as observed variables in subsequent analyses.

A measurement model examining if the three subscales of the ASQ would load onto a single latent variable "attribution style" was constructed. The measurement model for the Attribution Style Latent Variable was just identified so no fit statistics were available (see figure 5). However, the model indicated that none of the ASQ attribution indicators significantly loaded onto a single attribution latent variable (see table 12). Each indicator was used separately in subsequent analyses.

Based on the above analyses, the Attribution Style variables included in subsequent analyses consisted of the following observed variables: (1) the Internal Attribution subscale of the ASQ, (2) the Stable Attribution subscale of the ASQ, (3) the Global Attribution subscale of the ASQ, (4) the Locus of Control Behavior Scale, and (5) the Weighted Mean Controllability Score.

Process of Selecting Covariates

The following potential covariates were examined for their zero order correlations with expressed emotion: caregiver gender, care-recipient gender, location, education, health, cognitive status of the care-recipient, caregiver involvement, length of time the participant had served as a caregiver, and care-recipient agitation. Health, cognitive status, caregiver involvement, and agitation were significantly associated with at least one of the expressed emotion measures of interest. These variables were included if the analyses contained the outcomes that they were significantly associated with (see Table 13).

Structural Models

Hypothesis I Direct Effects Model: The Relationship between Attachment and EE

Structural Equation Models were used to examine the relationship between the attachment related predictors and the expressed emotion observed variables.

An initial model was constructed that examined the relationship between the attachment variables (the script based attachment latent variable and the two attachment questionnaires), the FMSS overall score, and the four subscales of the LEE (LEE intrusiveness, high emotional response, negative attitude towards, and tolerance/expectations) (see figure 6). Although not shown, the analysis also controlled for health status, and the degree of involvement of the caregiver and the cognitive status and degree of aggressive behavior of the care-recipient. All predictor variables and control variables were allowed to covary. The model demonstrated a strong overall model fit (CFI=0.997, TLI=1.00, RMSEA=0.005). The Adult Attachment Scale failed to significantly predict any of the expressed emotion variables. The SBSA latent variable demonstrated a significant association with the LEE high emotional response subscale (β=-0.361, Z=-1.996). Overall the model accounted for 23.5% of the variance in the LEE high emotional response subscale. Additionally, the PBIM observed variable was significantly associated with the FMSS measure of high expressed emotion (β=-0.211, Z=-2.915). Overall the model accounted for 22.1% of the variance in the FMSS measure of expressed emotion. Both of the significant relationships were in the expected direction indicating that greater attachment quality as measured by the script based attachment latent variable and retrospective report of the participant's relationship with their mother

were associated with lower levels of expressed emotion as measured by either the FMSS or the LEE high emotional response subscale.

Hypothesis II Indirect Effects Models: Attribution Style as a Mediator

I then conducted path analyses to explore the relationship between attribution styles and the two expressed emotion variables that were associated with the attachment variables, the FMSS and the LEE high emotional response subscale, to begin testing the mediational model. Each of the attribution style observed variables were used to separately predict the two expressed emotion variables (Overall FMSS ratings and LEE emotional response scale) (see figure 7). These two expressed emotion variables were selected for the indirect effects model because they demonstrated significant relationships with attachment variables. Although not shown, the analysis also controlled for the health status of the caregiver and the cognitive status of the care recipient (the two covariates that showed significant zero order correlations with the two expressed emotion outcomes) and allowed all predictor variables and control variables to covary.

The ASQ subscales and the LCBS were not significantly related to either of the expressed emotion measures and were not included in subsequent analyses. The analyses indicated that only the weighted caregiver controllability scale was significantly associated with any of the measures of expressed emotion. Specifically, the weighted caregiver controllability scale was significantly associated with the LEE high emotional response subscale (β=0.409, Z=3.667). Overall, the model accounted for 28.0% of the variance in the LEE high emotional response measure. This relationship was in the expected direction and suggested that caregivers who believed that their care-recipient

could control their negative behaviors tended to report responding to care-recipients with more anger or in ways that caused their care-recipients more distress

Analyses were then conducted to determine if the weighted caregiver controllability scale was significantly associated with the attachment questionnaires or the script based attachment latent variable which had previously demonstrated significant direct effects on the Overall Five Minute Speech Sample Rating and the LEE high emotional response rating (see figure 8).

The model demonstrated strong fit (CFI=0.990, TLI=1.00, RMSEA=0.019). These analyses indicated that there was not a significant relationship between either of the attachment quality questionnaires and caregiver controllability scale and these variables were dropped from subsequent analyses. However, there did appear to be a trend level association between the script based attachment latent variable and the controllability scale (β=-0.221, Z=-1.653). This trend was also in the expected direction and suggested that higher attachment quality as defined by the script based attachment latent variable was associated with less of a tendency to believe that care-recipients had control over problem behaviors. Additional analyses were conducted to examine whether an indirect effect might be present. Although not shown, the indirect effects model also controlled for the health status of the caregiver and the cognitive status of the care recipient (the two covariates that showed significant zero order correlations with the high emotional response subscale of the LEE) and allowed all predictor variables and control variables to covary (see figure 9).

The indirect effects model demonstrated strong overall model fit (CFI=0.991, TLI=1.00, RMSEA=0.021). Within this model, the controllability scale was significantly

associated with caregiver high emotional response (β=0.386, Z=3.557) and the script based attachment latent variable demonstrated a marginally significant negative relationship with caregiver high emotional response (β=-0.311, Z=-1.91). Both of these relationships were in the expected direction and indicated that lower levels of expressed emotion were associated with greater attachment quality or lower levels of belief that care-recipients could control problem behaviors. However, the script based attachment latent variable did not show a significant relationship to caregiver controllability (β=-0.206, Z=-1.233). These results do not support the presence of a significant indirect effect. Additionally, formal tests of the indirect effect were conducted on each of the individual datasets. None of the datasets provided results supporting a significant indirect effect.

Post Hoc Analyses 1: Cognitive Status as a Moderator of Current Self Reported Attachment

Although our findings indicate that the PBI scale and the script based attachment latent variable were significantly associated with expressed emotion measures, the Adult Attachment Scale (AAS) measure of attachment quality failed to demonstrate unique associations with any of the expressed emotion measures. To better understand why this may have occurred and the differences among the various attachment measures, additional analyses were conducted.

One hypothesis for the lack of a significant relationship between the AAS and EE is that the predicted relationships only hold when there is a low level of dementia. The AAS asks participants about the current level of comfort they experience when they think of or are in the presence of their mother. Given that most of the participants were caring

for their mothers and their mothers had dementia, their current experience of comfort in their mother's presence may not have always been an accurate reflection of their attachment quality. This hypothesis is consistent with a number of the comments that participants made both during informal portions of the interview as well as in written comments on the questionnaires. These comments indicated that prior to their mother's development of dementia, participants saw them as a source of support and comfort but as their dementia progressed, participants could no longer rely on their mother in that way.

To test this hypothesis, a regression analysis was used to determine whether a significant interaction existed between care recipient cognitive status and attachment, as measured by the AAS, on the relationship between AAS ratings and EE. In a regression model that contained the AAS, cognitive status scores, and an interaction term, the AAS did significantly predict FMSS overall EE ratings (β=-0.124, p=0.0413). This relationship was in the expected direction and indicated that higher attachment quality predicted lower FMSS overall EE ratings. Additionally, the interaction term between AAS and cognitive status was marginally significant (β=0.072, p=0.0671). The interaction was probed and results indicated that at high to moderate levels of cognitive deficit, the relationship between the AAS and the FMSS rating of EE was not significant; however, for care-recipients at low levels of cognitive impairment, this relationship was significant and in the expected direction such that lower levels of attachment quality based on the AAS were significantly associated with high EE ratings on the FMSS (see figure 10). These findings give support to the hypothesis that caregivers whose care-recipients were highly cognitively impaired were less likely to score the questionnaires in

a way that accurately reflected their attachment quality. This additional "noise" in the AAS measure caused by participants whose care-recipients suffered from high levels of cognitive impairment made it difficult to detect relationships between the AAS and expressed emotion. However for individuals whose parents were not significantly impaired, the AAS measure did in fact significantly predict FMSS based expressed emotion.

Post Hoc Analysis 2: Exploratory Findings Examining Moderators of the Relationship between Attachment Quality and Controllability

Given the lack of strong significant relationships between attachment quality and controllability, *post hoc* analyses were conducted to examine what additional factors may have acted to moderate this relationship. Path analyses were conducted to examine what additional factors were associated with controllability (see figure 11).

Although education, religion, aggressive behavior and degree of caregiver involvement were not associated with beliefs that the individual could control their behavior, cognitive status and caregiver strain were significantly predictive of caregiver stress. Both of these variables were explored for their potential moderating effects on the hypothesized relationships.

Post Hoc Analysis 3: Care-recipient Cognitive Status as a Moderator of Attachment's Relationship with Controllability

The greater the cognitive deficit the less caregivers were inclined to see their care-recipients' behavior as being under their control. For individuals who demonstrate clearly dementia related behaviors, caregivers may be more likely to attribute those behaviors to the disorder rather than to actions under the care-recipient's control. Thus, one might

expect that the relationship between attachment quality, beliefs about controllability and expressed emotion may only be relevant for care-recipients who are displaying lower levels of cognitive deficit. Under these conditions, the problem behaviors that caregivers experience may have been ambiguous enough that caregivers attribute them to the care-recipients volition rather than recognizing them as dementia related. *Post hoc* analyses were conducted to explore this hypothesis.

Regression analyses were used to predict controllability scores based on cognitive status, mean SBSA score and an interaction term however no significant interaction was found. Thus, although care-recipient level of cognitive deficits remains an independently significant predictor of controllability (β=-0.632, $p<0.0001$), it does not moderate the effects of attachment quality on controllability.

Post Hoc Analysis 4: Caregiver Strain as a Moderator of Attachment Quality's Relationship with Controllability

Higher levels of strain were also associated with a greater tendency among caregivers to report beliefs that a care-recipient could control their problem behaviors. The level of strain experienced by caregivers may have acted as a moderator of the degree to which attachment was associated with controllability and expressed emotion. Attachment theory indicates that the attachment system becomes activated in the presence of threat, danger or stress. For individuals who were experiencing low levels of stress, it is possible that their attachment system failed to become activated and thus were less inclined to show relationships between attachment, beliefs in controllability and expressed emotion.

To test this hypothesis, interactions were tested which examined whether the relationship between SBSA related attachment and attribution was moderated by degree of caregiver strain. This interaction failed to be significant suggesting that this hypothesis was not supported.

DISCUSSION

Overview and Summary of the Current Study

The first hypothesis tested in the current study was that higher levels of attachment quality would be associated with lower levels of expressed emotion. Our findings indicate that a complex pattern of relationships exist between the indicators of attachment quality and EE. Caregivers who provided a more positive retrospective report of their relationship with their mother during childhood tend to display less EE during an unstructured interview description of their parent. However, the more positive retrospective report was unrelated to a questionnaire measure of EE. In contrast, greater caregiver knowledge of attachment scripts was significantly associated with less EE based on a self-report questionnaire. However, caregiver attachment script knowledge was unrelated to the interview assessment of EE. The significant relationships that were found remained significant after controlling for a number of other variables describing the nature of caregiving (e.g. degree of caregiver involvement and caregiver self-reported health) as well as care-recipient aggression and cognitive status.

The second hypothesis tested was that aspects of attribution style, such as controllability, would mediate the relationship between attachment quality and EE. Our findings do suggest that caregivers who believe their care-recipients can control problem behaviors tend to display higher levels of EE; however, the role of controllability as a mediator of the relationship between attachment quality and EE was not supported. *Post*

hoc analyses, detailed above, were conducted to test potential hypotheses for the predicted relationships that were not supported.

The Relationship between Attachment and EE.

Our findings indicate that differences in caregiver characteristics, specifically attachment quality, are significantly associated with caregiving dynamics, specifically EE, above and beyond care-recipient characteristics such as aggressive behavior and cognitive status. Caregiving dynamics and factors influencing the outcomes of care-recipients are complex and highly emotionally charged areas of research. Historically, caregivers were blamed for a wide variety of their loved one's conditions. Caregiver behavior was cited as the cause of disorders ranging from schizophrenia to eating disorders to autism. Blaming caregivers for their family member's illnesses, the exacerbation of their symptoms, or negative interaction patterns between caregivers/care-recipients has been critiqued by both advocacy organizations such as NAMI and professionals working with families (Wedenoja, 1991). Over the years our understanding of patient outcomes, course of illness, and caregiving dynamics has increasingly incorporated the tasks of caregiving, informal and formal support or lack thereof, and individual care-recipient characteristics (Ohaeri, 2002; Spruytte, Van Audenhove, Lammertyn, & Storms, 2002; Heru, 2000; Marsh 1997; Droes, Meiland, Schmitz, & van Tilburg, 2004). Although these factors have clearly shown a significant, demonstrable, and consistent impact on caregiver and care-recipient outcomes (and our own data support these findings), a limited amount of research has examined individual caregiver characteristics as a potential contributor to both negative and positive outcomes in the caregiving relationship (de Vugt et al., 2004; Pot, Deeg, & Knipscheer, 2001;

Markiewicz, Reis, & Gold, 1997; Clark & Hartman, 1996). Our study adds to this limited body of research.

A complex pattern emerged from our analysis of the various indicators of attachment quality their relationships to EE. Attachment theory would predict that early experiences with one's caregivers influence the perceptions, expectations, and goals that an individual brings to future relationships, particularly relationships that involve caregiving. When caregiving is necessary, the manner in which individuals respond to care-recipient needs is influenced by previous models of caregiving. These previous experiences help guide the behavior of caregivers as they attempt to provide a sense of safety, security, and comfort to care-recipients when distressed (Bowlby, 1969; Ainsworth, 1989; Ainsworth, Blehar, Waters, & Hall, 1978; DeWolff & van IJzendoorn, 1997; Sroufe, 1988). Two significant associations were found that are consistent with this theory. The first suggests that greater attachment quality, as measured by greater knowledge of attachment scripts, was significantly associated with lower levels of EE as measured by a self report questionnaire of the degree to which caregivers become angry or respond in ways that make care-recipients more distressed. The second indicated that greater attachment quality, as measured by retrospective self-report of the quality of the childhood relationship with the participant's mother, was significantly associated with lower levels of EE, as measured by the frequency of critical or emotionally over-involved comments made during an unstructured interview.

Contrary to prediction, the caregiver's attachment quality was not found to be significantly associated with caregiver intrusiveness, negative attitudes toward the illness, or high expectations of the patient. In hindsight, although potentially important, these

caregiving variables are not as closely related to the types of caregiver behaviors that attachment theory attempts to predict (provision of security to explore and provision of comfort when distressed). Particularly for caregivers of individuals with dementia who may require significant monitoring, "intrusive" behaviors may ensure care-recipient safety. Additionally, negative caregiver attitudes towards the illness and high expectations of the patient may be more associated with caregiver knowledge and experience with dementia than with attachment quality. Thus, although these aspects of caregiver behavior may be important, they are less likely to be significantly related to attachment quality than the ability to respond in ways that provide comfort/do not exacerbate distress and critical attitudes towards the care-recipient.

Interpreting the Pattern of Findings

Although the above findings support the hypothesis that caregiver attachment quality is significantly associated with EE, the pattern of findings does not create a clear and consistent picture of these relationships. Our analyses indicate that different measures of attachment are associated with different measures of EE, thus the relationships between these constructs is complex. Our measurement models indicated that the various measures of attachment and EE did not represent a unitary construct; rather, they consisted of a variety of components which are independent of each other. Although it is impossible to definitively determine from these analyses why one aspect of attachment was related to a particular aspects of EE and not another, some hypotheses for the pattern of relationships observed are outlined below.

Although both of the attachment measures demonstrating significant associations with EE were designed to assess attachment quality, each assesses it in a different way.

The Parental Bonding Instrument is a retrospective report of the quality of the parent/child relationship based on the participant's memories of the warmth and protectiveness of their mother prior to age sixteen. In contrast, the Secure Base Script Assessment measures the degree to which caregivers have knowledge of a caregiving "script" when prompted to describe what might occur in certain caregiving situations. Previous research with these two measures has clearly demonstrated their independent convergent validity with the Adult Attachment Interview, which serves as the gold standard for assessing attachment among adults (Manassis et al., 1999; Waters & Waters, 2006; Tini, Cochran, Rodrigues-Doolabh, & Waters, 2003); however, our results indicate that these two measures were unrelated.

Similarly, our measurement model testing for a potential EE latent variable indicated that the two measures of EE did not load onto a single latent variable and were not significantly correlated. In fact, even the subscales of the EE questionnaire did not load onto a single latent variable. Again, the two EE measures attempt to assess EE in very different ways. The FMSS assesses EE through the frequency of critical or overly emotional statements made during a five minute unstructured and spontaneous speech sample. In contrast, the LEE assesses EE based on caregivers' self-report of their own overly emotional, intrusive, intolerant behaviors or negative attitudes. Again, although both measures have been found independently to show significant associations with the CFI, the gold standard for assessing EE (Kazarian, Malla, Cole et al., 1990; Magana et al., 1986; Malla, Kazarian, Barnes, & Cole, 1991), the FMSS was not significantly associated with the LEE. There is no known study that has attempted to use this combination of attachment and EE measures together and no known data regarding their

relationship both across and between constructs. Thus, this study represents an interesting glimpse into the complexity of these constructs and their relationships with one another.

Our findings indicate that more positive retrospective reports of mother/child relationships are significantly related to a lower frequency of critical or overly emotional statements during an unstructured caregiver interview about their care-recipient. However, this retrospective report was not related to a questionnaire measure of critical or hostile caregiving behaviors. In contrast, greater script knowledge was significantly associated with the fewer caregiver self-reported critical or hostile caregiving behaviors. But script knowledge was unrelated to the frequency of critical or emotional statements made during the unstructured interview.

The lack of correlations among measures intended to measure the same construct and inconsistencies across measures in the pattern of correlations between constructs may be due in part to the psychometric properties of each of the measures, and differences in the aspect of attachment and EE each measures is focused on. Research on the psychometric properties of these scales suggests systematic biases that may help to explain the pattern in our findings. Research on the Parental Bonding Instrument has indicated that although it is a good predictor of attachment quality among individuals with optimal attachment histories, it tends to be insensitive to individuals who either idealize their parents or express significant anger towards their parent (Manassis et al., 1999). Thus, individuals who have less than optimal attachment styles would be more likely to be categorized as having an optimal attachment style by the Parental Bonding Instrument. Research has also indicated that the Five Minute Speech Sample has tended to under-report cases of high EE in (Hooley & Parker, 2006). Thus, some individuals

who would be categorized as having high EE by the Camberwell Family Interview would be found to show low EE by the Five Minute Speech Sample. Given that both of these measures tend to be overly "generous" in their assessment of attachment and EE, individuals in the "borderline" range of scores on both these scales would be classified as having secure attachment and low EE which would allow for significant relationships between these two measures to still be detected. Furthermore, the Parental Bonding Instrument's tendency to be less sensitive to individuals experiencing anger towards parental figures and the LEE's focus on caregiver anger may have contributed to difficultly in detecting significant relationships between the PBI and the LEE high emotional response scale.

Additionally, differences in what aspect of EE and attachment each measure focuses on could help to explain the pattern of findings. The association between caregiver reports of more frequent angry or highly emotional responses to their care-recipients and less "script knowledge" but not retrospective attitudes towards the caregiver's mother may be due to differences in how closely related script knowledge and retrospective attitudes are to the angry and distressing caregiver behavior measured by the LEE. The SBSA rating of "script knowledge" is believed to reflect unconscious knowledge of optimal caregiving behaviors and thus is designed to assess a caregiver's "operating procedures" for caregiving which would directly influence caregiving behaviors. In contrast, retrospective reports of parental relationship quality are less directly linked to specific caregiver behaviors.

The finding that more positive caregiver attitudes towards the care-recipient (FMSS) were significantly associated with more positive retrospective reports of a

caregiver's memories of their mother (PBI) but not significantly associated with "script knowledge" for caregiving (SBSA) may again be due to the differences between how the two attachment measures attempt to assess "attachment quality." Retrospective reports of the relationship quality between the participants and their mothers when the participants were children are likely influenced by intervening years of experience with their mothers. In contrast, "script knowledge," represents a largely unconscious construct that is formed by early experiences with parents but less sensitive to later events. The greater sensitivity of retrospective report to the impact of intervening years may provide some explanation for the pattern of relationships between the current critical attitudes towards care-recipients and the two attachment measures. Given that the FMSS based attitudes towards their care-recipient are also influenced by many years of later experiences with their care-recipients, it seems reasonable that the attachment measure that is similarly impacted by those years would be more related.

In summary, it appears that EE may not be a unitary construct but may consist of a number of parts, among them: (1) attitudes towards care-recipients and (2) behaviors towards care-recipients. Similarly, attachment quality may not be a unitary construct and may consist of at least two different aspects that separately influence later caregiving: (1) scripts for caregiving behavior and (2) retrospective memories of early parental behavior. The pattern in our findings reflects the different aspects of these construct. Specifically, attitudinal aspects of EE were more significantly associated with retrospective memories of early parental behavior. And behavioral aspects of EE were more significantly associated with "script knowledge" for caregiving behaviors. These findings support the utility of both of the measures for assessing attachment quality and suggest that the

combination of these measures may provide unique information about caregiving dynamics.

The Role of Controllability

The second primary finding consisted of testing attribution style as a potential mechanism for the above relationships. Our findings indicated that the more participants believed that care-recipients could control problem behaviors, the greater their tendency to respond to them with anger or in a way that would cause them greater distress. This association was found above and beyond the effects of other caregiver or care-recipient characteristics (e.g. caregiver health, care-recipient aggressive behavior). As previously mentioned, attribution processes have repeatedly demonstrated a significant relationship with EE (Hooley & Licht, 1997; Wendel, Miklowitz, Richards, & George, 2000; Tarrier et al., 2002; Bolton et al., 2003). Our findings replicate those of Tarrier et al. (2002). Furthermore, our study utilized a new questionnaire measure for assessing controllability. It is the first known study to replicate these findings with a questionnaire rating of controllability.

Controllability as a Potential Mediator of the effect of Attachment Quality on EE

The study originally proposed that the relationship between attachment quality and EE would be mediated by attribution style; however, the results failed to support this conclusion. It appears that both attachment quality and attribution style have significant independent effects on EE. There were some indications of a trend between "script knowledge" and the degree to which caregivers believed that their care-recipient could control their problem behaviors; however, in the context of their effect on caregiver angry or distressing behavior, this relationship was not significant. To explore the reasons for

the lack of a significant indirect effect, potential moderators of the relationship between caregiver script knowledge and caregiver beliefs in problem behavior controllability were tested. None of the potential moderators demonstrated significant interactions with the relationship between the quality of caregiver's script knowledge and the belief in problem behavior controllability.

Although the variables measured in the current study did not moderate this relationship, it is possible that other variables that were not measured in the study are masking the proposed indirect effect. Potential additional variables include caregiver's knowledge of symptoms of dementia and care-recipient pre-morbid personality characteristics. Our study did not contain any measure of the caregiver's knowledge of dementia symptoms and future studies may attempt to incorporate this data to better understand the potential benefit of disease education on caregiving dynamics. Additionally, our study did not measure pre-morbid personality characteristics of the care-recipient. It is possible that high levels of beliefs in controllability do not represent misinterpretation on the part of caregivers. For some, beliefs in controllability may reflect an accurate assessment of their care-recipient (i.e., individuals with dementia are in fact sometimes stubborn, spiteful, and engage in "problem behaviors" that they do have some control over). Focusing solely on caregiver attachment and attribution processes fails to recognize the full interpersonal context in which these dynamics occur. Additional research on care-recipient characteristics would provide a clearer picture of these relationships.

Finally, although additional moderators that mask the indirect effect should be considered, it is important to entertain the possibility that an indirect effect does not exist.

Although other research has indicated that attachment quality is significantly associated with attribution style, the aspect of attribution style that attachment quality predicts may not be the same aspect of attribution style that significantly predicts EE. The lack of association between the various attribution style measures in our study suggests that attribution style consists of a variety of components. Although attachment research has indicated that attachment quality is linked to caregiver beliefs and interpretations of care-recipient behaviors (Dagget, O'Brian, Zanolli, & Peyton, 2000; Benoit, Zeanah, Parker, Nicholson, Coolbear**,** 1997; Slade & Cohen, 1996), there is a need for further work delineating what specific aspects of caregiver interpretations are impacted.

Clinical Implications

These findings provide clear evidence that attachment quality, both overt, conscious recollections of relationships with a caregiver's mother and implicit, unconscious script knowledge for current caregiving processes, are significantly associated with EE. These findings have practical implications for guiding the development of interventions for caregivers. Currently, the majority of caregiver interventions focus on caregiver stress management and support. Although these factors are also critical components of the caregiving experience and our own analyses reinforce the unique contribution that these factors have on caregiving dynamics (Coon, Thompson, & Steffan, 2003; Depp, Krisztal, Cardenas, 2003; Schulz, 2000), attention should also be paid to the caregiver's assumptions and expectations about caregiving based on their earlier experiences with their own caregivers. Given that the largest proportion of frail older adults are cared for by adult children (Wolff & Kasper, 2006), the caregiver's previous relationship with their parental figures, often the individual

whom they are now caring for, is a critical component of the experience of that caregiver. Interventions targeted at helping caregivers to better understand and process their new roles may be informed by attachment theory (Johnson & Whiffen, 2003).

Additionally, our findings have provided further evidence that beliefs about the controllability of care-recipient problem behaviors are significantly associated with EE (Tarrier et al., 2002). These findings suggest that providing psychoeducation regarding the symptoms of dementia and challenging beliefs and assumptions about the controllability of certain care-recipient problem behaviors may help caregivers to better understand and more appropriately interpret the behavior of their care-recipients. These interventions may be usefully informed by cognitive behavioral strategies that provide psychoeducation and explore the assumptions and beliefs that clients have about others' behavior.

It is clear from our findings that attachment quality and a sense of controllability both have significant independent effects on EE. Thus, both of these factors may be useful targets for intervention. Additionally, the finding that both of these targets independently contribute to EE suggests that targeting both attachment quality and beliefs about controllability as a part of intervention could potentially change caregiving dynamics via two relatively independent pathways. Thus, an intervention targeting only one of these variables is likely failing to capture the full potential benefit that would be gained from addressing both of these issues.

In summary, caregivers of individuals with dementia may benefit most from an intervention that integrates two approaches. First, cognitive behavioral approaches that provide skills to better cope with stress and anxiety, psychoeducation about dementia,

and strategies to challenge beliefs about the controllability of care-recipient symptoms. Second, an approach informed by attachment theory that focuses on helping caregivers process and better understand their relationship history with their parents, shifts their assumptions, expectations, and goals around care, and helps them to perceive their current relationship with their care-recipient in new ways.

Study Limitations and Future Directions

Despite the contribution of this study to understanding attachment processes among adult children caring for parents with dementia, a number of limitations are important to consider. The following section outlines key limitations in (1) the measures selected, (2) the generalizability of the findings based on sample characteristics, (3) the appropriateness of the analytic method used, and (4) the cross-sectional nature of the data. The following section also outlines future directions for research based on those limitations.

One limitation in this study was the inability to utilize the Camberwell Family Interview (CFI). Constraints on time and financial resources made the brief interview and questionnaire measures appropriate for this study; however, the decision to forgo the use of the CFI, which has more established clinical significance, has implications for the conclusions that can be confidently drawn from these findings. Although the FMSS and the LEE have been validated against the CFI, they do not have the same history of predicting relapse or negative outcome (Hooley & Parker, 2006). It is not clear whether measures of EE used in the current study have the same clinical implications as CFI ratings of EE. Thus although our findings indicate significant relationships between attachment quality and the LEE and FMSS based measures of EE, the clinical

significance of these findings is yet to be determined. Additional work using the CFI would provide additional evidence for the clinical significance of these findings.

An additional limitation of the study relates to the generalizability of the findings. Although caregivers of individuals with dementia were actively recruited using a variety of methods, the final sample was highly homogenous in its racial and socioeconomic characteristics. There are findings to suggest that attachment and EE operate in similar but not identical ways across racial and socioeconomic groups (Kymalainen, Weisman, Resales, & Armesto, 2006; Wei, Russell, Mallinckrodt, & Zakalik, 2004). Given the vast literature outlining culturally specific aspects of the caregiving experience, it would be extremely important to explore what aspects of these relationships are consistent as well as different across cultural groups. Such findings would have implications for not only understanding the process of caregiving across various groups, they would also be important for understanding how to adapt interventions for specific populations. Thus, additional work is necessary to explore how these findings may vary across populations.

Another limitation of the current study involves the relatively small sample size used given the analytic method. Structural equation modeling is designed for large samples and a variety of studies have indicated biased findings for small sample sizes (<100). Specifically, these findings suggest that small sample sizes tend to result in too frequent rejection of H_0 (Anderson & Grebing, 1984). We attempted to focus our interpretations on model indices that were more robust to smaller sample sizes. For example, simulation studies have indicated that for samples of 100-200 the GFI and the AGFI fit indices were strongly influenced and downward biased, but the CFI and RMSEA remained relatively robust (Fan, Thompson, & Wang, 1999). Thus, although

these findings should be interpreted with caution, they do provide some preliminary evidence for the hypothesized relationships and additional work with larger samples could provide more compelling evidence for the hypotheses.

An additional advantage of a larger sample would be the possibility of exploring the nature of the associations across different types of caregiving relationships. Given the lack of variability in the types of caregivers in our sample (i.e., relationship of caregiver to recipient), we were unable to explore differences in the dynamics that exist across relationship types. One might predict that significant differences in caregiving dynamics exist between daughters caring for mothers vs. daughters caring for fathers vs. sons caring for mothers vs. daughter-in-laws caring for father-in-laws. The different aspects of attachment may have different degrees of importance for predicting EE across these different relationships. For example, the SBSA, which measures more generalized attachment script knowledge, may be more robust in predicting caregiving dynamics across relationships, but the PBI may be better at predicting the relationship between adult children caring for their mothers. It may be useful to examine differences in the dynamics across these relationships and specifically the relative contribution of various aspect of attachment for predicting caregiving dynamics across types of relationships.

A final limitation of the study involves the cross sectional nature of the data and its limitations for determining the direction of causality. Although our findings are consistent with the hypothesized causal model, they would also be consistent with the hypothesis that greater feelings of hostility or criticism in a caregiving relationship results in negatively biased memories of childhood experiences with parents and a more impoverished script for caregiving. This hypothesis would be consistent with state

dependent learning principles of selective memory retrieval (i.e. when in a given affective state, individuals are more likely to recall mood congruent memories than mood incongruent memories). There are also findings which indicate that attachment quality does not always remain stable, particularly in the presence of significant negative life events or trauma (Hamilton, 2000; Lewis, Feiring, & Rosenthal, 2000; Waters et al., 2000; Weinfield et al., 2000). Thus, some might argue that a parent's development of dementia may result in changes in attachment status. However, it is unlikely that a parent's development of dementia would result in the shift in attachment status that has been associated with major traumatic events (e.g. concentration camp or torture experiences). In fact, the attachment literature suggests that in situations when caregiving is called for, such as a parent's development of dementia, attachment scripts become most activated and come to influence caregiving behavior. However, further research may be necessary to confirm the direction of causality proposed in this study.
Thus, additional longitudinal research that attempts to assess attachment quality at the start of caregiving and determine whether it changes over the course of the caregiving relationship would provide greater insight into the direction of the hypothesized relationships.

Cross-sectional data also does not provide a clear picture of the process of providing care over time. It is possible that the relationships among variables explored in this study may shift over time and that certain relationships may be more or less critical at certain times in the caregiving process. For example, it is unclear how attachment quality would be associated with EE earlier in the caregiving experience, when care-recipient symptoms are more ambiguous (e.g. forgetting about an appointment, forgetting a

person's name who they just met, etc.). Better attachment quality may predict a better ability to give care-recipients the "benefit of the doubt" and still be associated with lower levels of EE. Alternatively, if an individual does not recognize the parent's condition as a situation requiring "caregiving processes," attachment may have no relationship with EE. In fact, high attachment quality may even be related to high levels of EE. At this stage, the future caregiver may not yet recognize the need for his or her role to shift and as a result the future care-recipient's failure to meet expectations (forgetting an appointment or a birthday) may result in anger, disappointment, and criticism. Longitudinal studies of the caregiving experience would provide significant insight into the factors that are most critical and predictive of caregiving patterns and caregiver/care-recipient outcomes at different phases of the caregiving process.

Table 1

Conditions where outcomes are predicted by Expressed Emotion

Disorders/Conditions	**Sample of Literature Indicating Effects of EE on Outcomes**
1. Depression	Hooley, Orley, & Teasdale (1986); Vaughn & Leff (1976)
2. Bipolar Disorder	Miklowitz, Goldstein, Nuechterlein, Snyder, & Mintz (1988)
3. Eating Disorders	Butzlaff & Hooley (1998)
4. Obesity	Fischmann-Havstad & Marston (1984)
5. Alcoholism	O'Farrell, Hooley, Fals-Stewart, & Cutter (1998)
6. OCD	Chambless & Steketee (1999)
7. Agoraphobia	Chambless & Steketee (1999)
8. PTSD	Tarrier, Sommerfield, & Pilgrim (1999)
9. Children's depressive behavior	Asarnow, Tompson, Woo, & Cantwell (2001)
10. Other childhood disorders	Stubbe, Zahner, Goldstein, & Leckman (1993); Vostanis, Nicholls, & Harrington (1994)
10. Other childhood disorders	Stubbe, Zahner, Goldstein, & Leckman (1993); Vostanis, Nicholls, & Harrington (1994)
11. Borderline Personality Disorder	Hooley & Hoffman (1999)
12. Asthma	Wearden, Tarrier, Barrowclough, Zastowny, & Rahill (2000)
13. Epilepsy	Wearden, Tarrier, Barrowclough, Zastowny, & Rahill (2000)
14. Dementia and Alzheimer's disease	Tarrier et al. (2002); Vitaliano et al. (1993)

Table 2.

Standardized Cronbach's Alphas for Questionnaire Measures.

Construct Measured	Variable	Standardized Cronbach's Alpha
Expressed Emotion	LEE intrusiveness	0.960
	LEE high emotional response	0.977
	LEE attitude towards	0.982
	LEE tolerance/expectation	0.969
Attachment Quality	Adult Attachment Scale	0.996
	Parental Bonding Instrument	0.993
Attribution Style	ASQ-internal	0.963
	ASQ-stable	0.964
	ASQ-global	0.960
	Controllability	0.757
	Locus of Control Behavior Scale	0.186

Table 3

Descriptive Statistics for Attachment Questionnaires

Variable	Mean	Standard Deviation	Range	N
Adult Attachment Scale (AAS)	62.43	22.12	23-110	80
Parental Bonding Instrument (PBI)	74.75	15.62	39-99	96

Note: Higher scores indicate more of the construct (greater attachment behaviors or bonding with parent)

Table 4

Descriptive Statistics for Secure Base Script Assessment

Variable	Mean	Standard Deviation	Range	N
Adult Child/Parent Scripts				
Accident	3.96	1.24	1.25-7	92
Lost	4.10	1.28	1.50-9	93
Lunch	3.73	1.30	1.00-7	92
Parent/Young Child Scripts				
Baby's Morning	4.11	1.09	1.50-7	92
Doctor's Office	4.10	1.31	1.50-8	92

Note: Higher scores indicate more of the construct (greater attachment behaviors or bonding with parent)

Table 5

Descriptive Statistics for the Level of Expressed Emotion Scale

Variable	Mean	Standard Deviation	Range	N
LEE Overall Score	10.91	5.38	3-31	94
LEE intrusiveness	4.40	2.70	0-11	94
LEE high emotional response	3.02	1.94	1-9	94
LEE negative attitude towards	1.83	1.11	0-7	94
LEE tolerance/expectation	1.64	1.91	0-11	94

Note: Higher scores indicate higher expressed emotion (greater intrusiveness or negative attitudes and lower tolerance for the care-recipient)

Table 6

Descriptive Statistics for the Five Minute Speech Sample Measure of Expressed Emotion (N=88; 11 inaudible tapes; 1 refusal)

Variable	Low	Borderline/Neutral	High
FMSS Overall	65 (74%)	NA	23(26%)
Criticism	61 (69.3%)	11 (13.6%)	16 (18.2%)
Emotional Over-involvement	72 (81.8%)	6 (6.8%)	10 (11.4%)
Relationship Quality	4 (4.6%)	70 (79.5%)	14 (15.9%)
Initial Statement Quality	1 (1.1%)	70 (79.5%)	17 (19.3%)

Table 7

Descriptive Statistics for Attribution Style Measures

Variable	Mean	Standard Deviation	Range	N
Weighted Controllability	4.52	3.14	0.33-16.71	94
Locus of Control Behavior Scale (LCBS)	37.92	5.93	15-53	97
Attribution Style Questionnaire (ASQ) Internal Attribution	55.45	6.27	38-72	93
Attribution Style Questionnaire (ASQ) Global Attribution	53.76	10.29	30-81	93
Attribution Style Questionnaire (ASQ) Stable Attribution	55.36	6.08	39-74	93

Note: Higher scores indicate more of the construct (greater belief in controllability or more internal attribution)

Table 8

Pearson's Correlations among Attachment Indicators (N=80-92)

Variable	1	2	3	4	5
1. SBSA - Accident	---	.41***	.43****	-.16	.045
2. SBSA - Lost		---	.50****	-.04	-.06
3. SBSA - Lunch			---	-.03	-.03
4. Adult Attachment Scale (AAS)				---	.36***
5. Parental Bonding Instrument (PBI)					---

*p<0.05 **p<0.01 ***p<0.001 ****p<0.0001

Table 9

Measurement Model Results for Script Based Attachment Latent Variable

Attach by	Estimate	SE	Est./SE
Lost	1.000	0.000	0.000
Accident	0.990**	0.261	3.798
Lunch	0.936**	0.253	3.703
Variance of Script Based Attachment Latent Variable	0.512**	0.202	2.532

*p<0.05; **p<0.01

Table 10

Pearson's Correlations among Expressed Emotion Indicators

Variable	1	2	3	4	5	6
1. FMSS - Overall	---	.20	.02	.32**	.04	.18
2. LEE - Overall		---	.68****	.73****	.54****	.80****
3. LEE - Intrusiveness			---	.19	.06	.28**
4. LEE – High Emotional Response				---	.36***	.55****
5. LEE – Negative Attitude Towards					---	.49****
6. LEE – Tolerance/Expectations						---

*p<0.05 **p<0.01 ***p<0.001 ****p<0.0001

Table 11

Measurement Model Results for Expressed Emotion Latent Variable

EE by	Estimate	SE	Est./SE
LEE - Intrusiveness	1.000	0.000	0.000
LEE – High Emotional Response	2.254	1.168	1.929
LEE – Negative Attitude Towards	1.950	1.372	1.421
LEE – Tolerance/Expectation	3.363	1.885	1.784

*p<0.05; **p<0.01

Table 12

Pearson's Correlations among Attribution Style Indicators

Variable	1	2	3	4	5
1. Attribution Style Questionnaire – Global	---	.32**	.19	.008	.21*
2. Attribution Style Questionnaire - Stable		---	.30**	-.06	-.04
3. Attribution Style Questionnaire - Internal			---	-.02	.16
4. Locus of Control Behavior Scale (LCBS)				---	.03
5. Weighted Mean Controllability Scale					---

*p<0.05 **p<0.01 ***p<0.001 ****p<0.0001

Table 13

Measurement Model Results for Attribution Style Latent Variable

Attribution Style by	Estimate	SE	Est./SE
Internal Attribution	1.000	0.000	0.000
Stable Attribution	1.321	0.837	1.578
Global Attribution	1.152	0.950	1.213

*p<0.05; **p<0.01

Table 14

Bivariate Correlations Among Potential Covariates and Indicators of Expressed Emotion

	FMSS overall	LEE intrusive	LEE emotional responsive	LEE Attitude Towards	LEE Tolerance/ Expectation
Caregiver gender	-0.17	-0.08	0.01	-0.01	-0.04
Care recipient gender	0.03	0.10	-0.04	0.02	-0.001
Location	0.04	-0.19	-0.04	0.04	-0.19
Education	0.06	-0.20	0.06	0.11	0.05
Health	-0.14	-0.02	*-0.27***	-0.09	-0.17
MDS Cogs	*-0.25**	-0.10	*-0.21**	0.11	-0.12
Caregiver involvement	-0.10	*0.26**	0.07	0.05	0.12
Months care giving	0.01	-0.01	-0.04	-0.002	-0.13
Agitation	-0.008	0.06	0.08	*0.29***	0.12

*p<0.05 **p<0.01 ***p<0.001 ****p<0.0001

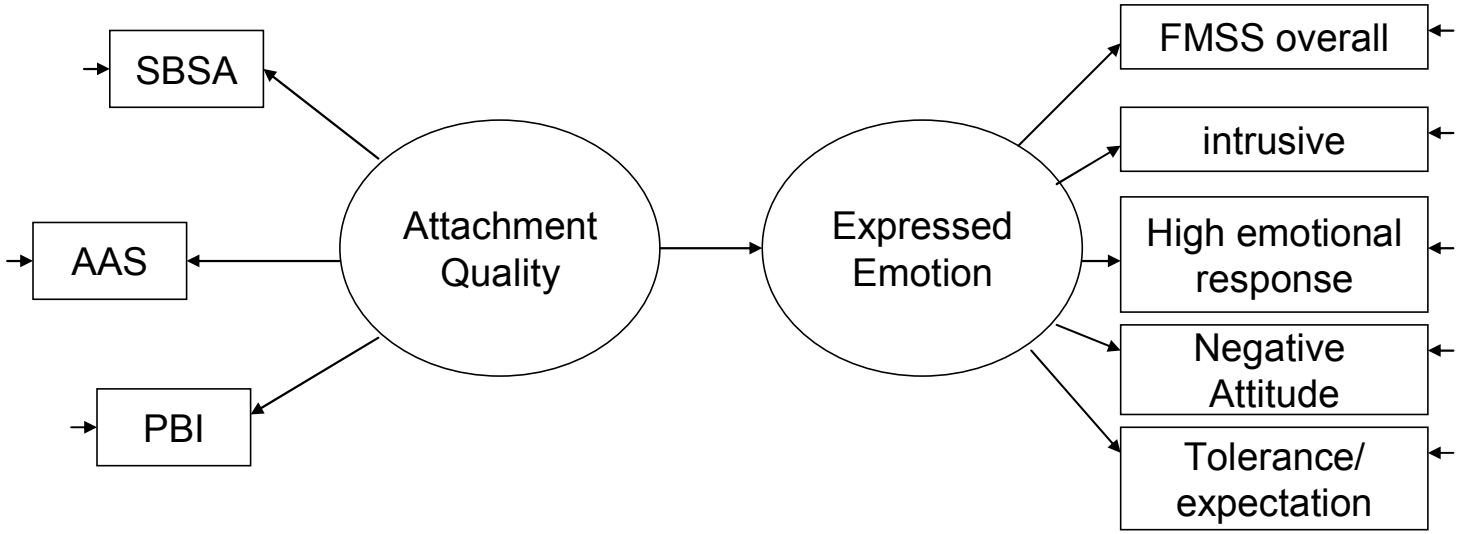

Figure 1. Hypothesized Direct Effects Model of the Relationship Between Attachment Quality and EE

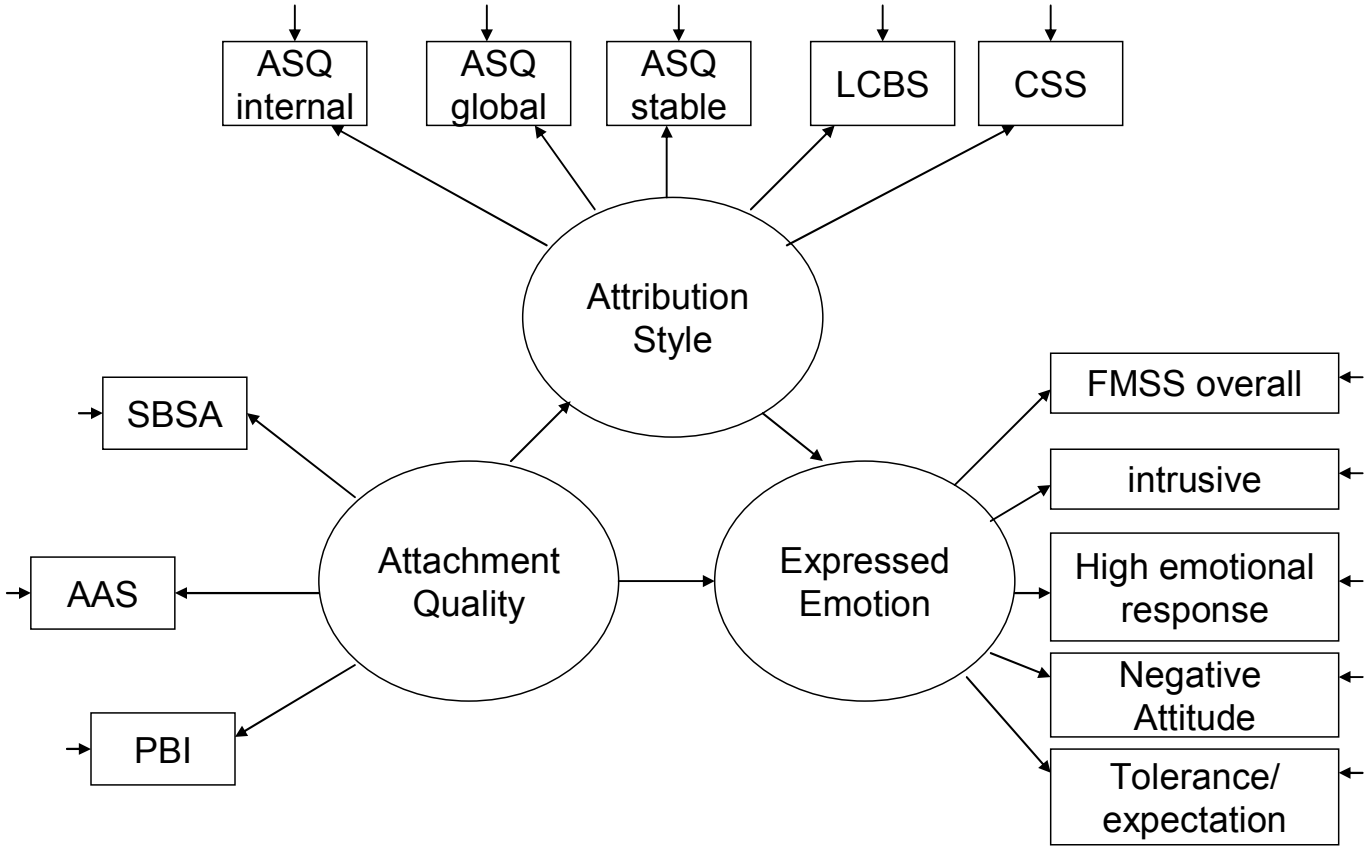

Figure 2. Hypothesized Model of Attribution Style as a Mediator of the Relationship Between Attachment Quality and EE

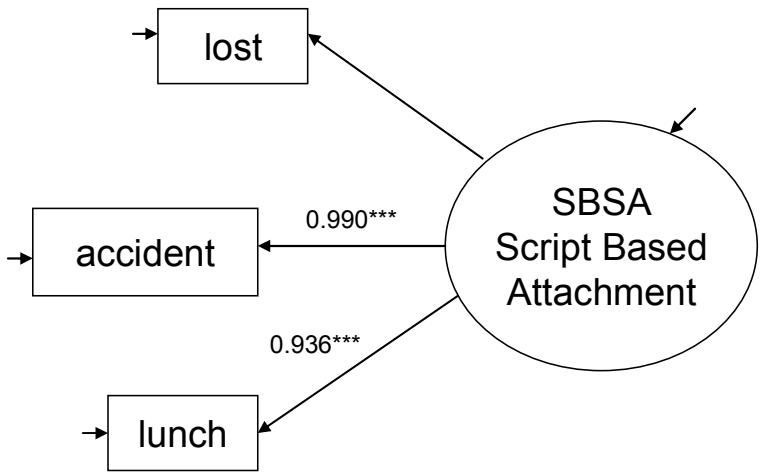

Figure 3. Measurement Model for Attachment Script Latent Variable

SBSA – Secure Base Script Assessment ; The numbers represent path coefficients for the indicated paths. *p<0.05. **p<0.01. ***p<0.001.

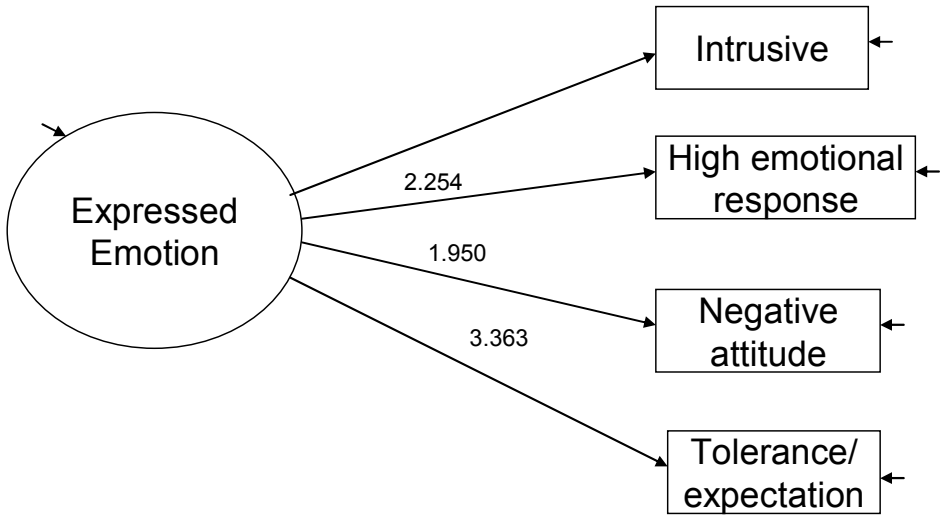

Figure 4. Measurement Model for LEE Based Expressed Emotion
The numbers represent path coefficients for the indicated paths. *p<0.05. **p<0.01. ***p<0.001.

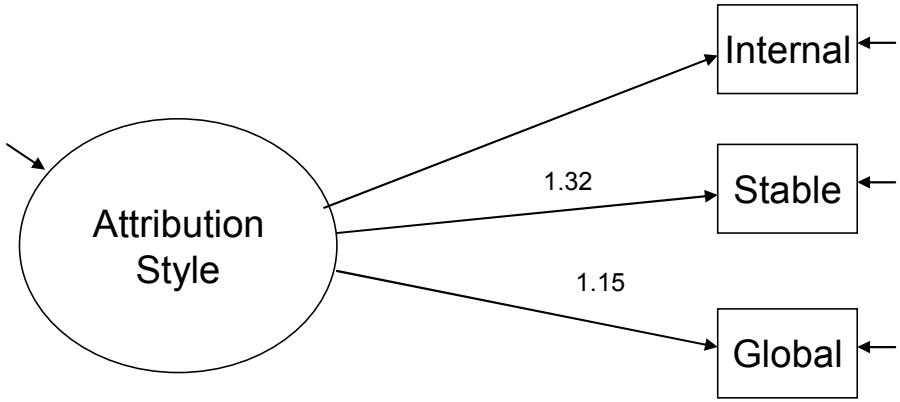

Figure 5. Measurement Model for Attribution Latent Variable

The numbers represent path coefficients for the indicated paths. *p<0.05. **p<0.01. ***p<0.001.

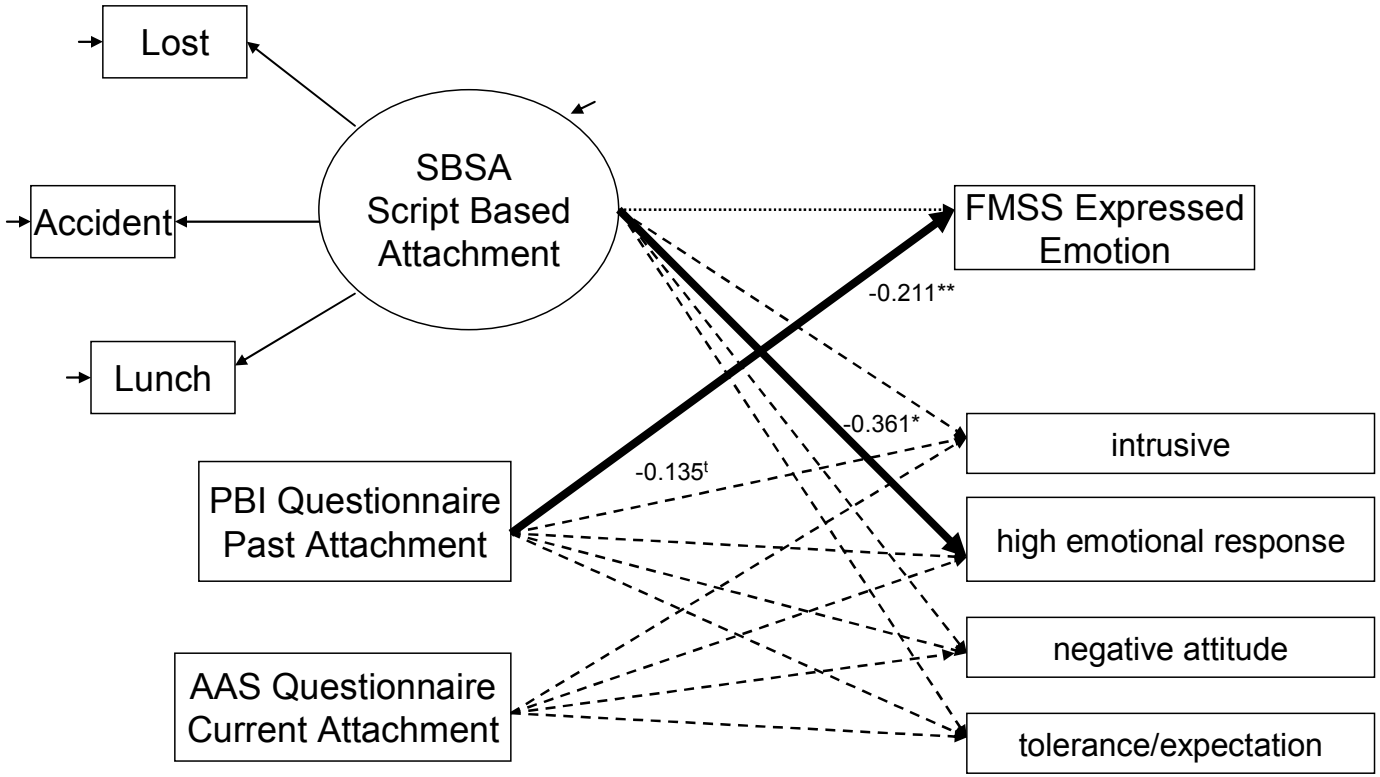

Figure 6. Structural Model for Attachment and Expressed Emotion

Note: Model controls for caregiver health and involvement and care-recipient cognitive status and aggressive behavior
Dashed lines indicate that the path was not significant. The numbers represent path coefficients for the indicated paths. ^{t} p<0.10. *p<0.05. **p<0.01. ***p<0.001.

SBSA – Secure Base Script Assessment; PBI – Parental Bonding Instrument; AAS – Adult Attachment Scale;
FMSS – Five Minute Speech Sample; LEE – Level of Expressed Emotion Scale

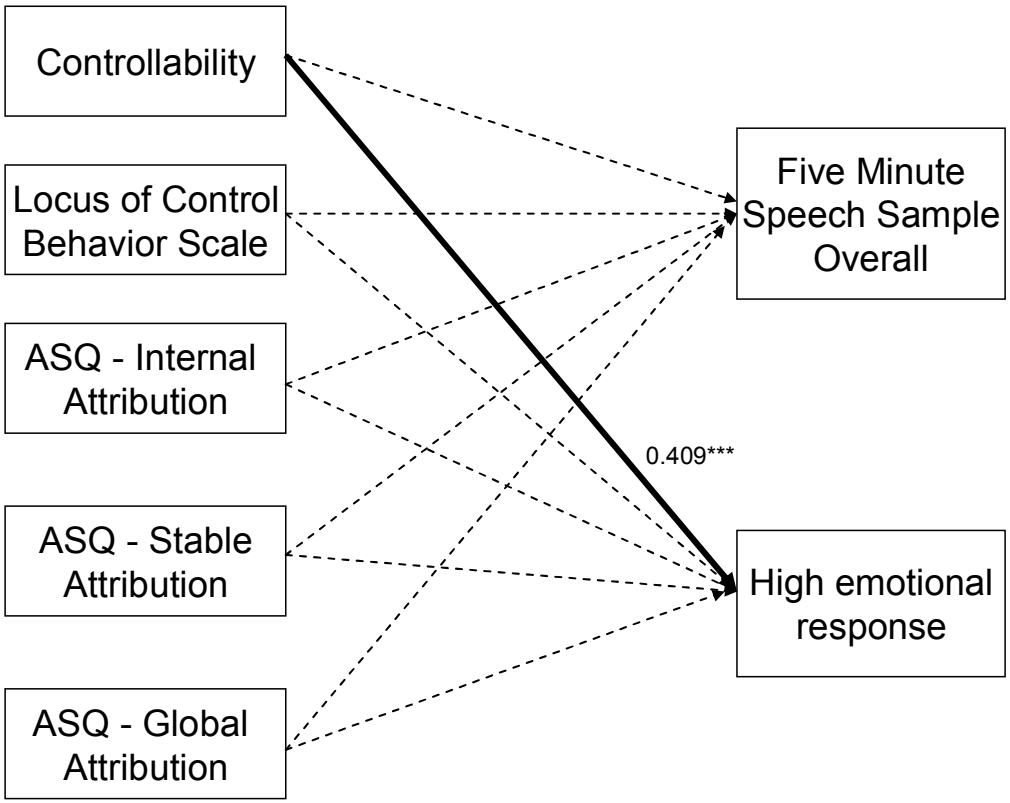

Figure 7. Path Analyses for the relationship between attribution scales and Expressed emotion

Note: Model Controlled for caregiver health and care-recipient cognitive status

Dashed lines indicate that the path was not significant. The numbers represent path coefficients for the indicated paths.

t p<0.10. *p<0.05. **p<0.01. ***p<0.001.

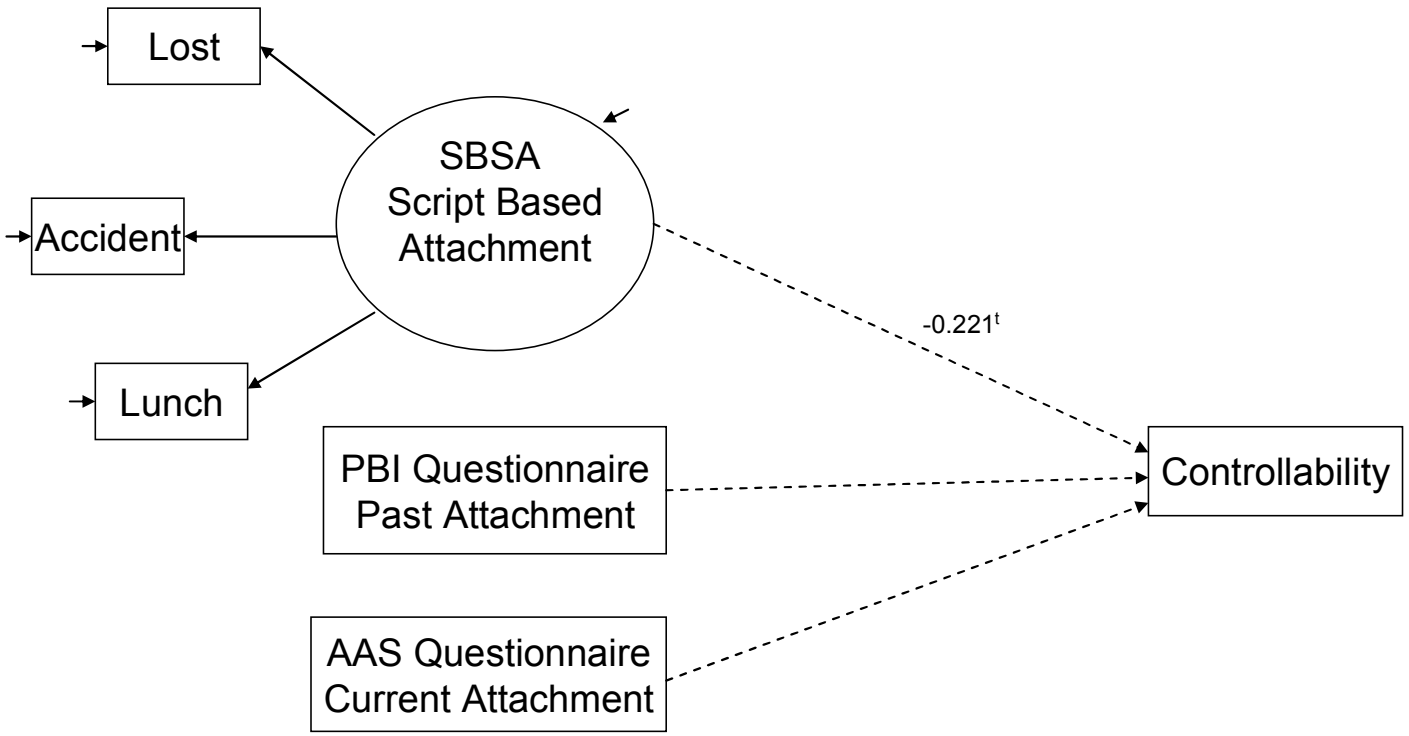

Figure 8. Structural Model Examining Attachment and Controllability

Dashed lines indicate that the path was not significant. The numbers represent path coefficients for the indicated paths.

[t] p<0.10. *p<0.05. **p<0.01. ***p<0.001.

SBSA – Secure Base Script Assessment; PBI – Parental Bonding Instrument; AAS – Adult Attachment Scale

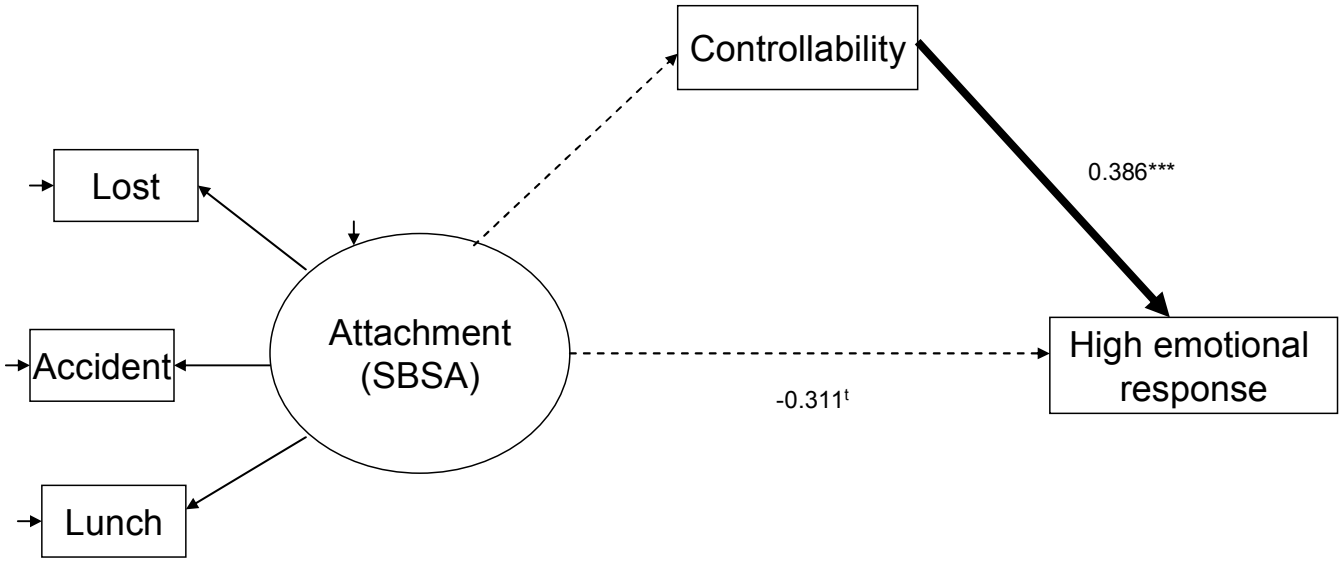

Figure 9. Indirect Effect of Attachment Quality on Emotional Responsiveness Through Controllability

Note: Model Controlled for caregiver health and care-recipient cognitive status

Dashed lines indicate that the path was not significant. The numbers represent path coefficients for the indicated paths.

[t] p<0.10. *p<0.05. **p<0.01. ***p<0.001.

SBSA – Secure Base Script Assessment

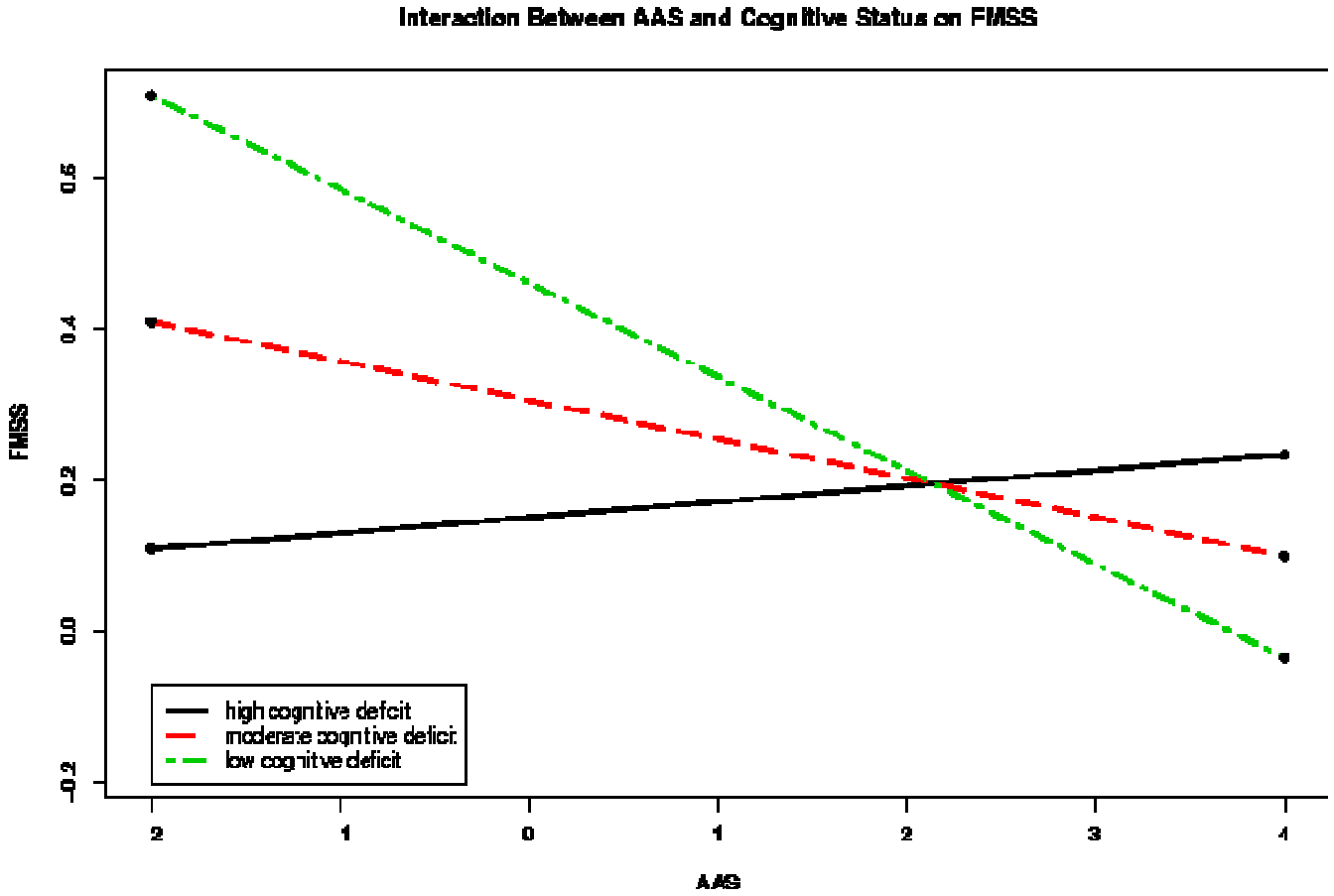

Figure 10. Interaction between Adult Attachment Scale and Cognitive Status on FMSS Expressed Emotion

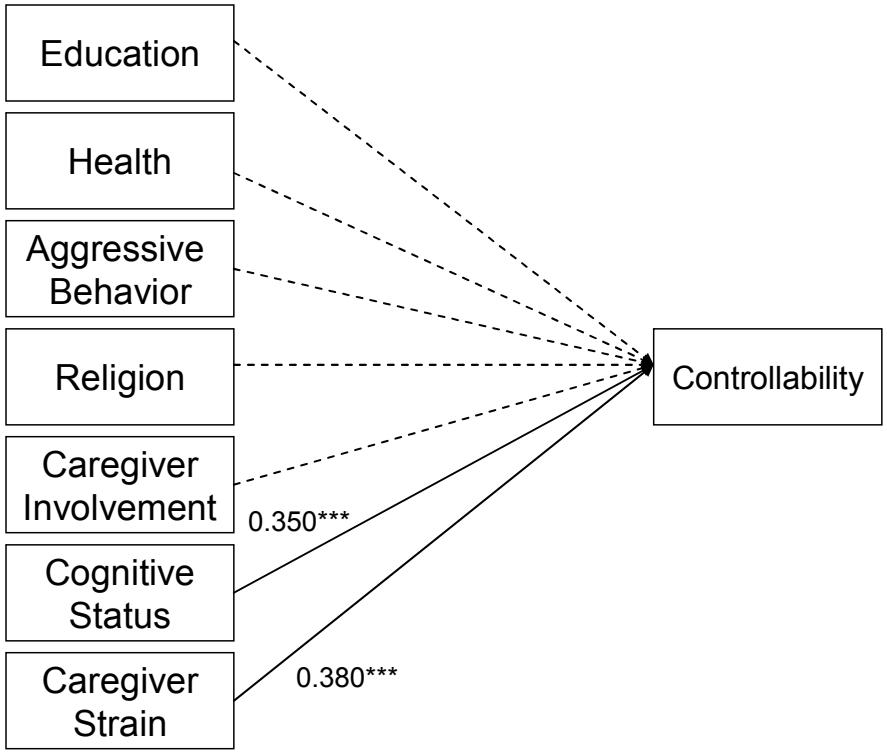

Figure 11. Indirect Effect of Attachment Quality on Emotional Responsiveness Through Controllability

Note: Model Controlled for caregiver health and care-recipient cognitive status
Dashed lines indicate that the path was not significant. The numbers represent path coefficients for the indicated paths.
t p<0.10. *p<0.05. **p<0.01. ***p<0.001.
SBSA – Secure Base Script Assessment

APPENDIX I

THE UNIVERSITY
OF NORTH
CAROLINA
AT CHAPEL HILL

date

Address

Dear M/rs. Name,

Thank you for contacting us regarding your interest in the current study! We wanted to send you some additional information about the study and we'll be calling you in the next few weeks to answer any questions you might have.

In 2001, 45 nursing homes and assisted living facilities participated in a project funded by the National Alzheimer's Association. More than 400 residents and families across four states participated in this project, designed to better understand how care is provided to individuals with dementia. The family members we interviewed provided information that was extremely valuable in understanding the care their loved ones received. Enclosed is a summary of some of the study findings that you might find interesting.

We are now conducting a follow up to that project, which shifts the focus to the experiences of the family caregiver - individuals like yourself. The study attempts to understand what your relationship and experiences have been like, in an effort to better support and help other caregivers through the challenging process of caring for someone with dementia.

When we call, you are under no obligation to talk to us and you may refuse to participate or ask that the call be returned at a later date. When we speak, we will tell you about the study, and the types of questions we will ask. If you choose to participate in a telephone interview, we will schedule a time that is convenient for you; this interview need not take place immediately. You will have the opportunity to refuse any or all of the interview. We also will ask if we may send you a questionnaire to complete. A copy of the consent form that provides details about the study is enclosed; we will discuss it with you when we call. You do not need to do anything with it at the present time.

Learning about your experience as a caregiver is invaluable. More and more people are suffering from dementia and loved ones struggle to find ways to care for them. If you

are able to talk about your experiences, what you share may help us to learn how to help other families and people who face similar situations.

We look forward to speaking with you, at (phone number). If this number is incorrect, or if you have questions in the meantime, feel free to contact the principle investigator of this project, Cory Chen, at
(919) 966-7935. Thank you for your consideration, and we look forward to talking with you.

Sincerely,

Cory K. Chen, MA
UNC Chapel Hill
Institute on Aging - Doctoral Fellow
Principle Investigator

University of North Carolina-Chapel Hill (UNC-CH)
Consent to Participate in a Research Study
Adult Subjects: Family Member

Medical IRB Study #: 95-Fam/Med-246
Consent Form Date: May, 2004

Title of Study: Family Caregivers to Individuals with Dementia

Principal Investigator: Cory K. Chen, MA
UNC-CH Department: Cecil G. Sheps Center for Health Services Research
Department of Psychology, UNC – CH
Phone number: 919-966-7935
Co-Investigator: Sheryl Zimmerman, Ph.D.

You are being asked to take part in a research study. The investigators listed above are in charge of the study; other professional persons may help them or act for them.

What are some general things you should know about research studies?
Research studies are designed to gain scientific knowledge that may help other people in the future. You may or may not receive any direct benefit from participating. There may also be risks associated with participating in research studies. Your participation is voluntary. You may refuse to take part in the study, or you may stop your participation at any time.

Details about this particular study are discussed below. It is important that you understand this information so that you can decide in a free and informed manner whether you want to participate. You will be given a copy of this consent form. You are urged to ask the investigators named above, or staff members who may assist them, any questions you have about this study at any time.

What is the purpose of this study?
The purpose of this research study is to learn about the experiences of family members of individuals with dementia.

How many subjects will participate in this study?
If you decide to participate, you will be one of approximately 100 subjects in this research study.

How long will your participation last?
Your participation in this study means answering questions in an interview and filling out a questionnaire. The interview will approximately 45 minutes and the questionnaire, which will be mailed to you, should take also take approximately 45 minutes.

What will happen if you take part in the study?
During this study, you will be interviewed once over the telephone about your relationship and experiences with your family member. A questionnaires also will be sent to you in the mail asking additional questions about your experiences as a caregiver.

Are there any reasons you should not participate?
There are no reasons for you to not participate in this study.

What are the possible risks or discomforts?
There are no risks or discomforts from participating in this study, although it is possible you may feel sad talking about your family member. If so, you can end your participation and resume it at another time if you are willing.

What are the possible benefits?
Although you may not directly benefit from the study, future family caregivers of individuals suffering from dementia may benefit from the information gained by this research.

How will your privacy be protected?
No participants will be identified in any report or publication about this study. Although every effort will be made to keep research records private, there may be times when federal or state law require the disclosure of these records, including personal information. This is very unlikely, but if it is ever required, UNC-CH will take all steps allowable by law to protect your privacy. Your answers will be coded with identification numbers, not names, and the list linking numbers and names will be kept in a separate file. The questionnaires will be kept in the research offices of UNC-CH, and will be locked when not in use. The only people who will use the information will be research staff who are working on the project.

Will you be paid for participating?
You will not be paid for participating in the study.

Will it cost you anything to participate?
The sponsor will pay the costs of this research. There will be no costs to you for participating.

What if you want to stop before your part in the study is complete?
You can withdraw from this study at any time, without penalty.

What if you have questions about this study?
You have the right to ask, and have answered, any questions you may have about this research. If you have further questions, you should call Cory K. Chen, MA at (919) 270-3290.

What if you have questions about your rights as a subject?
This research has been reviewed and approved by the Committee on the Protection of the Rights of Human Subjects (Medical IRB) at UNC-CH. If you have any questions or concerns regarding your rights as a research subject, you may contact the Chairman of the Committee at (919) 966-1344.

Subject's Agreement:

I have read or had explained to me the information provided above.
I voluntarily agree to participate in this study.

____ I have read the information on this form

____ I have had the information on this form explained to me

_____
Subject Name (Print)

_____ _____
Signature of Subject/Authorized Representative Date

_____ _____
Interviewer/Investigator Date

_____ _____
Interviewer Verification of Verbal Informed Consent Date

Script for Initial Contact with Family Members

Version 5.10.05

"Hello, can I speak to _____ (insert family member name), please?"

"Hi, this is _____, calling from UNC-Chapel Hill. I received your contact information from _____ (insert facility administrator name) at _____ (insert facility name)."

"About a week ago, we sent you a letter about a study that you had participated in two years ago. I just wanted to give you a call to thank you once again for helping us 2 years ago and to see if you'd received the letter we'd sent you which also contained a brief summary of some of the things we learned from your participation."

"I'm also calling because we're doing a follow up to that study and we wanted to talk to you to see if you might be interested in helping us again. Do you have a minute for us to discuss that or should I call back at a more convenient time?" (if not convenient - reschedule, otherwise, continue)

"This time we're focusing on folks like you, the family members who are helping to take care of parents or in-laws who have dementia to get a better idea of what your life is like and what factors influence that experience. The goal of the study is to better understand how to go about improving your life and your relationships with your parents. The study would involve a telephone interview and answering some questionnaires that we'd mail you. The interview should take about 30-45 minutes. I'll will ask some general questions about caregiving, ask you to talk about what your relationships with _____ is like, and there's a story telling task that I'll have to that gives us an idea of what people think about caregiving in general.

The questionnaires should take about 30-45 minutes to fill out. The questionnaires ask about your relationship with your _____ (insert father, mother, spouse, etc.), about how your life has been impacted by them, and also has some general questions about you to get a sense of who you are and what your relationships with other important people in your life are like.

The total time it would take for you to participate is about an hour to an hour and a half. The information you provide would be invaluable for us to get a better idea of what your life as caregivers is like and what things make your relationship with your _____ (insert father, mother, spouse, etc.) harder or easier. Would you be willing to help us with this?"

"Just to make sure, are you still the primary family member responsible for your _____ (insert father, mother, spouse, etc.)" (if not, ask them for who is)

If they agree to participate and are the primary family caregiver schedule an appointment.

"We will be sending you a packet of materials in the mail. The packet will include questionnaires and some papers that we'll need when we speak on (date). If you could fill out the questionnaires before the interview, that would be great, that way I can answer any questions you might have about anything in the questionnaire. However, there will be one envelope that will be marked with "do not open" across the seal. It's important that you don't open that up until we talk on the phone on (date) and I'll tell you at that time when you can open it. This is important because we need those materials to be new to you when we speak and if you've already seen them, the interview does not work like it's supposed to. Also, please make sure that you're in a room where you won't be distracted or interrupted. If it's possible to speak over a land line rather than a cell phone that would be preferable. We're tape recording all of the interviews and the sound quality is just much better over a land line. Does that sound alright? Do you have any questions?"

If not questions: "Great! I look forward to speaking to you on _____ (insert date and time) and we'll be sending you the packets shortly. We'll also call to confirm that you've received all the materials the day before the interview. Feel free to give my supervisor a call if you have any questions before then or need to change the time of our interview, my supervisor's name is Cory Chen and his phone number is (919) 966-7935. Thanks and take care!"

DO NOT give your personal phone numbers to participants. Give them Cory's office number.

Script for Leaving 1st Message:
"Hello. My name is _____. I'm calling from the University of North Carolina at Chapel Hill. We got your contact information from _____ (name of administrator) at _____ (name of facility). You had helped us with a study we did 2 years ago for the Alzheimer's Association and we recently mailed you a letter with some findings from that study. We just wanted to call and make sure you got our letter and to thank you for participating. We also wanted to tell you about a new study that we're doing that focuses on people like you, families that are caring for a parent with Alzheimer's disease. I'll try to call you back, but if you'd like to reach us, you can talk to my supervisor, Cory Chen, at (919) 966-7935. Hope to talk to you soon!"

Script for 2nd and 3rd Messages:
"Hi, this is _____ again, calling from UNC Chapel Hill. Just wanted to try to touch base about the letter we sent and to tell you about our new study. I'll try to reach you again later, but feel free to call my supervisor, Cory Chen, at (919) 966-7935."

Script for 4th/Final Message:
"Hello, this is _____ calling once again from UNC-Chapel Hill. It seems like we're having a hard time connecting. I do hope that you'll consider helping us with the study, but I don't want to continue to bother you if you're not interested so if you'd like

to learn more about the study, please call the director of the study, Cory Chen at (919) 966-7935. Thank you."

Script if Potential Participant's Parent has Died

"I'm so sorry to hear about your loss. I apologize for calling and bothering you. If you have any questions about the study or the previous study, please feel free to give my supervisor a call. His contact information should be in the letter we sent."

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